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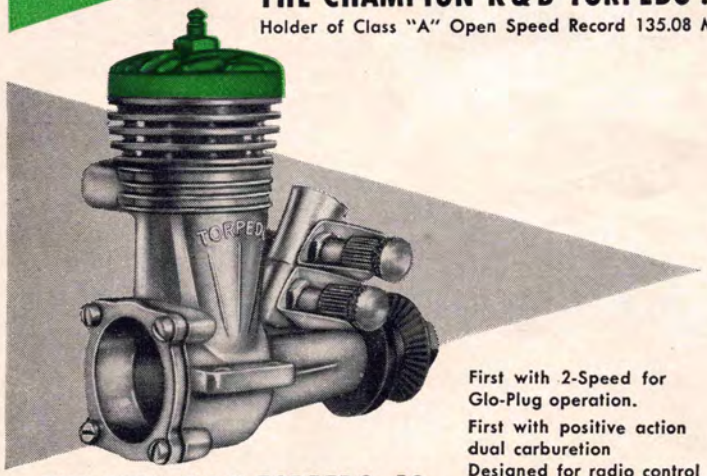

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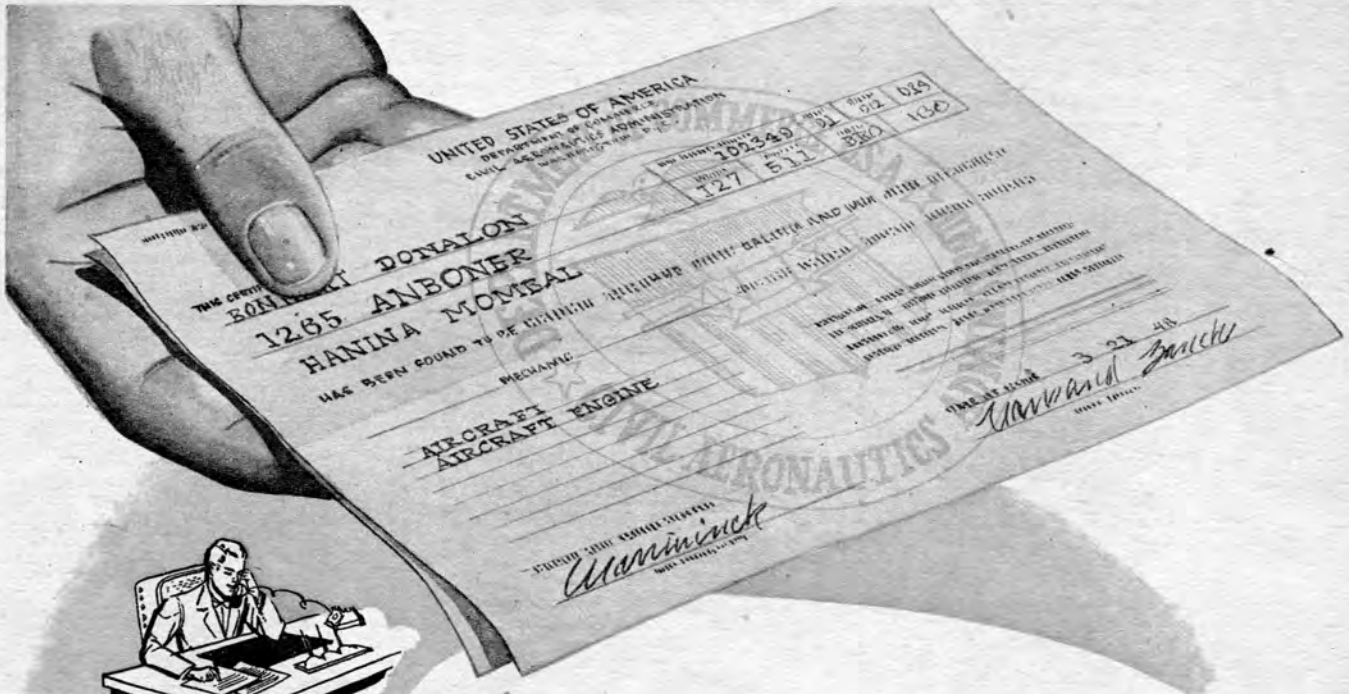

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Cover by Roy Cross shows (top) Reds' U-MiG-15 2-seater jet trainer. At bottom is U-Il-28 pilot conversion trainer version of well-publicized Il-28 attack bomber, many of which are reported based opposite Japan

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FROM THE READER

He Flew in First Dirigible . . . I was much interested to note your illustration of the first successful dirigible described on page 34 of your "Air Progress."

For your information this dirigible was built in Los Angeles, Calif., in 1904 in Chutes Park. I had a small machine shop nearby and did a lot of the work on this ship and flew with Capt. Baldwin on its first flights. Capt. Baldwin had an associate, a Capt. Navenshoe. Like most early motors the engine would not run very long and we had two long ropes which we would let down to the ground and people would pull us back to Chutes Park.

We sat on a couple of boards across the triangular frame under the bag and when we wanted to go down we slid the boards forward, and backward to go up. We didn't know what an aileron was at that time.

W. H. Hollister, Consulting Engineer, Oak Park, Ill.

Wants Twin-engine Scale . . . I'd just like to say that I think Walt Musciano's plans are great. But why stick to single-engined aircraft? How about some twin-engined scale ships, such as the C-45, C-46, C-47, C-119, twin Bonanza, Twin Navion, Aero Commander and such. Those twin-engined ships really sound sweet in the air. I hope we'll see some in Air Trails.

A/2c A. E. Swanson, Former Vice-President Circle Aces, Guam.

• See Air Trails "Annual" for 1953 and the March issue of Air Trails for twin-engine models.

Research on Douglas Mail Plane . . . Enclosed you will find a money order in the amount of thirty-five cents for your plan #1151. I want this for the Douglas Mail Plane as a few of us at the Douglas Long Beach Engineering Dept. are digging into the Engineering Records Dept. at Santa Monica for further authentic information on the ship and hope to come up with some nifty scale free flights.

Grover W. Moore, Corona Del Mar, Calif.

Correction on "Short Circuit" . . . Dick Everett had the information wrong on the picture in his column in the February Air Trails. It was my model all right but I did the design work with suggestions from Bob and I was using Aerotrol receiver and Aristrol transmitter instead of 465 mc. equipment. Incidentally, I have tried out Macnabb's new 27 mc. transmitter and find it is really potent. . . . I plan to modify one of these for tone modulation and put the tone equipment where the batts are now and run a cable to a separate batt box.

Doug Spreng, Burbank, Calif.

• Sorry, Doug. Thanks for the info.

Doug Rolfe's Jenny . . . Working on the drawings for "Jenny Was a Real Lady" sure brought back memories. More years ago than I care to dwell on, my brother and I picked up three crashed Jennys and from the combined remains built one serviceable ship. We did all the work ourselves, including covering, doping and painting. And the rigging (which was really something). We even carved a set of cabane struts. The top wing of the finished job had no less than five splices in the main and rear spars. The top fuselage longerons had two splices which we reinforced with sheet steel jackets. I suppose such a job would not get by inspection today but the fact remains that we carried hundreds of passengers in this plane without incident and gave it the full aerobatic treatment.

I wonder if amongst your readers there are any very old-time Marine pilots who remember the bright yellow Jenny which visited them at Paris Island and into which they so obligingly installed a brand-new motor and a set of instruments the like of which no Jenny of its day was ever known to carry, all in return for free rides for the officers' wives and girl friends. I wonder? This same ship of ours was also used on charter by the old Runser-Turner team in their wing-walking act when one of their own ships was out of commission. I don't know whether Roscoe knew about the splices, though.

Douglas Rolfe

Color Scheme of L-19 . . . This is the first time I've ever written to any magazine to make comments of any kind. First I want to say that you have the finest model aviation magazine I have ever seen.

My comment concerns the model of the Army L-19 aircraft you had in a recent issue. In one picture you showed the "real" thing in official Army dress of O. D. paint and silver numbers and lettering. On the best authority I correct you by saying all lettering and numbers are international orange-yellow. I'm an ex-Army Sgt. whose duty it was to paint this particular aircraft in an Army Ordnance Light Aircraft Maintenance Company. A new Army Special Regulation published not long ago states that all Army aircraft will now be all O. D. No more gray undersurfaces. Also, the lettering U. S. Army will replace the letter A and three numerals now on the wings. The vertical stabilizer still has the lettering U. S. Army and a minimum of four radio call numbers made up of the year model of the aircraft and the last three numbers of the serial number. Having worked with and on the L-19 since its introduction into the Army in spring of 1951 (that's when they first got to my base), I must say it's a wonderful aircraft and the model looks like a clean little outfit.

Harry W. Ishoy, Sacramento, Calif.

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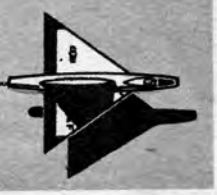

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are most of the new items. Sometimes there isn't time or space to include them. But, if available, we have it.

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11", 12" in 6, 8 pitch 35
13" in 8 p, 14" in 6, 8 pitch 50

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Tornado: 6" or 6" in 3, 4, 5, 6, 7, 8 p; 7" in 4, 6, 8 p. 29

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	#16—2½x1½x3½

#19—1½x1½x1½: .50
#20—2½x2½x1½: .85
Proom: #14—2x1x2 85
#15—2x1x2½ 85
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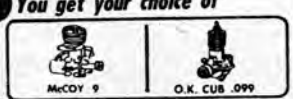

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"AT" FORUM

Got a question or comment? Questions will be answered by Air Trails' Experts Advisory Board. Shoot 'em in . . .

What Caused Loops? . . . I ran into some trouble recently while flying a Douglas Mailplane Half-A scale, constructed from Air Trails. I followed the plans faithfully, carefully checking the incidence angles in both wings and stabilizer. After completing the plane and powering it with a Torp .049 engine, I again checked for any warps and found none. Before the first test flight I located the balance point and it coincided approximately with that shown on the plans. I added three degrees right rudder after a few test glides in order to make the plane circle to the right in the glide. I then added two degrees right and one degree downthrust to the motor and launched the plane on its first powered flight.

It climbed to a height of about 50 feet and suddenly went into a series of tight right circles. It did not spiral-dive in, but it did not gain any altitude either, merely circling very tightly until the motor stopped, coming down in a smooth glide. I then reduced the right turn somewhat and tried another flight. It immediately went into a loop, and crashed into the ground. With less power, it climbed higher before it went into a series of tight loops until the motor stopped. Can you possibly explain to me what the cause of these loops is?

David Thom, Buffalo, New York

• It seems that you have a potential super performer if you can iron out your thrust line difficulties. Assuming that your glide is flat with a slight turn, it is obvious that you were correct in deciding that the right tight power circles were caused by excessive right thrust. However, it seems that you removed too much right thrust and thus converted the spiral climb energy of the engine into a series of loops. If these were perfectly vertical with no tendency to spiral climb, then you require *slightly* more right thrust. It must be remembered that thrust adjustments must be made in very small steps, so take care. *Very slightly* more right thrust from your present adjustment plus an infinitesmal amount of added downthrust should do the trick. Do not add as much right thrust, however, as in your original adjustment.

The reason for the steady climb to about fifty feet and then the violent looping or circling were probably caused by the engine leaning out in the air and thereby developing more power.

Free flight craft utilizing offset thrust lines will invariably stall or loop (depending on the amount of power) when the thrust line is excessively neutralized. Added downthrust must accompany the above mentioned adjustment in small doses.

Lifting Power of Dyna-Jet . . . Would the Dyna-Jet engine lift a plane with a wingspan of 48 inches and weight of about 10 lbs.?

Jimmy Fried, Englehart, Ont., Canada

• To retain good flying qualities, a Dyna-Jet powered model shouldn't weigh over five pounds. Although the engine would lift more weight, flying would be sluggish. A.M.A. rules for flying in U. S. limit control-line model weight to four pounds, although bigger models are flown. Flying wire size must be large for such models and wire drag then becomes a big factor, hurting flying performance.

Top limit for Dyna-Jet powered model should be about five pounds and five feet wingspan.

Rubber Lube . . . As an amateur in the field of rubber powered endurance, and novice to the new techniques in development, I am at a loss to obtain information on prolonging the life of the rubber power. My greatest success has been two flights. I would appreciate your suggestions in reference to a longer life of rubber power in regard to best lubricant and proper application.

T/Sgt. William Jims, Langley AFB, Va.

• Castor oil, glycerin and liquid green soap used in equal amounts is good. Boil together until thick. The lube is best applied by pouring a small amount in the palm of your hand and rubbing in. For best results wash rubber in plain water and allow to dry before lubing. Allow lube to set in rubber 24 hours before winding. Do not stretch rubber more than 3 times or wind more than 90% capacity.

Enlarging Plans . . . I have a set of plans from the Glenn L. Martin Co. of their Martin 2-0-2. The plans are 1 in.=6 ft., and what I need is someone who knows how or can enlarge these plans to full size.

William Waddingham, Beaver Falls, Pa.

• The cost would be prohibitive, the way you see it. The best thing to do is to take the plans to a photostat house and have it enlarged by the photostat process.

Planes for McCoy .09 . . . What's wrong with the McCoy ".09"? There aren't many planes for it except the Testors line. All of the others have too small a wingspan. Please tell me the correct size wingspan for it.

Roger Little, Fairfield, Iowa.

• There are numerous kits available for engines such as the McCoy .09. Ads in this magazine specify the size of the engine suitable for the kit model.

Span for this size engine should be from about two to three feet. The smaller sizes, about two feet, should be chosen for heavier solid plank type of construction. Stunt types with lighter construction can be as large as three feet.

75 ST and Everitt . . . Can you please tell me what is meant by prewinding a rubber motor and how it is done? Also what is the effect castor oil has on the life of rubber if any? "Red" Everitt's Wakefield has a folding prop backplate hinge made of 1020 75 ST. What is 75 ST, and where do I get it?

T. P. Kirk, Jr., Bedford Hills, N. Y.

• Prewinding is used two ways. One for tensioning a motor, the other to condition the motor to contest flights. Prewinds are put in a motor for tensioning two ways. One by making up the motor double length, winding turns in and doubling the motor, or by making 2-½ strand sections and winding each the same direction for tensioning. The number of turns depends on hook distance and motor length.

Castor oil is a good lubricant for motors and will definitely prolong motor life.

The 75 ST is a very hard dural of recent development; 24 ST is a satisfactory substitute.

Drag Caused by Cowl . . . Could you tell me just how much of the total drag on an average speed model is caused by the front cowl opening?

John Grissmer, Cincinnati, Ohio

• The drag caused by the total cowl on a speed model is only 5%. Most drag is from the lines.

Those 4-bladed Props . . . Please tell me how I can get fuel proof aluminum finish. I don't want a silver finish. I want it for a P-47. Also where can I get a four-bladed prop? I mean for Miniature's P-47. How much will these four-bladed props cost?

Pete Lehman, Paducah, Ky.

• A good aluminum finish is one of the hardest to achieve. One model we saw was sprayed with Aero-Gloss. At least six coats must be sprayed on and rubbed down between and after the final coat. Proper spraying and plenty of elbow grease are the main requirements. See Page 18-19 of Air Trails Model Annual for 1952.

There are no detailed scale props available for models such as the "Miniature" P-47. You can make your own by using two gas model props of suitable size. Notch each hub halfway through so that props fit together flush. Use wide blade types such as Top Flite. You may wish to carve additional detail at the hubs. Four-bladers are not recommended for flying. They are knuckle-busters and are not as efficient as a regular two-blader.

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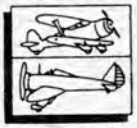

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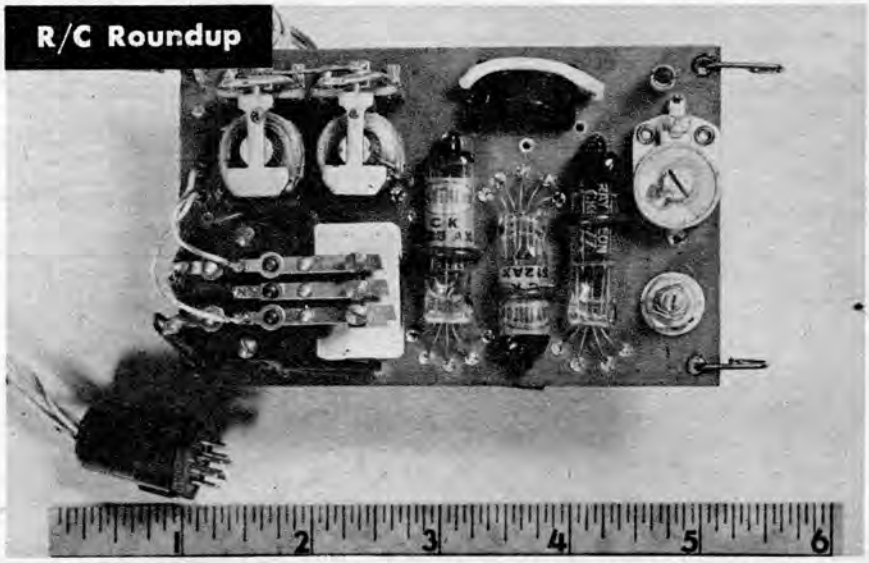


Audio tone receiver built by John Curry has proved successful. Standard 3-tube McEntee receiver modified with 2.2 meg. gridleak on final tube; E. D. reed unit coil replaces sensitive relay.

Trammell Investigates Folding-Wing Designs

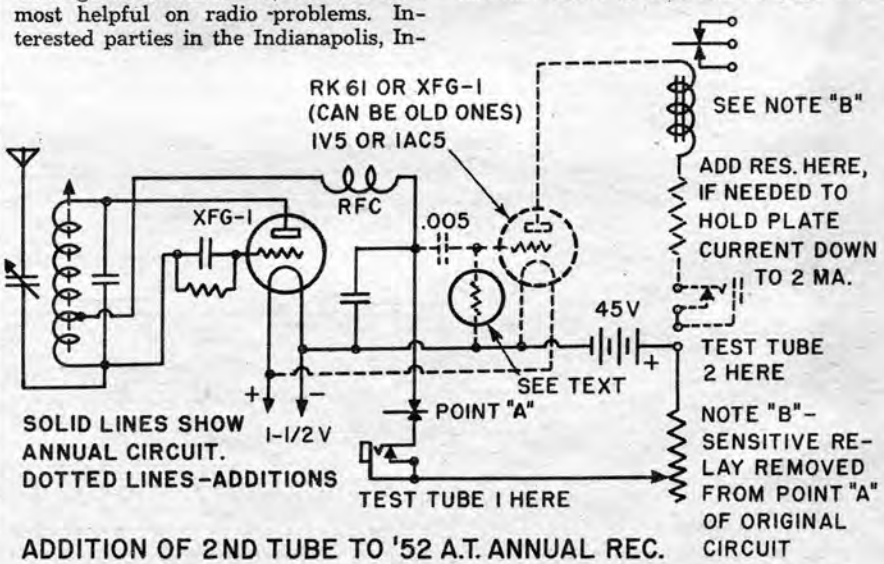
■ Lots of R/C news from around the country—let's get right into it. We have a complaint from Earl Lombard, who feels that youngsters in U. S. modeling aren't making the most of what they have in this field. Earl flew all over the world during the war, and says he is ashamed at the lack of initiative of young U. S. builders, considering the quantity and variety of materials they have available in our country. He is looking for some young R/C enthusiasts in his area; here's your chance to get a bit of expert help, you R/C minded youngsters. Contact Earl at 51 N. College St., Washington, Pa.

A recent note from Gene Foxworthy says that he is located in Puerto Rico; no R/C work, as there are too many mountains, and too much wind. Gene is active on 10 meter phone—call is KP4TO.

A long talk with another R/C oldtimer, Joe Hughes, brings out the fact that there is quite an active R/C-only informal club in his locality. He says they have a dozen or so regulars, including Vernon Macnabb, who has been most helpful on radio problems. Interested parties in the Indianapolis, Indiana, area might contact Joe at 2002 E. Kessler Blvd.

Speaking of meetings, what is it about an R/C club get-together that will bring out the modelers on the worst night of the winter?! The meeting night for a Northern N. J. group had been designated some time in advance, but when it arrived, a terrific ice storm was at its height; due to wires down, many of the members couldn't even be reached by phone. But when 8 p.m. rolled around, the cars started to arrive, amid the crash of falling tree limbs and the eerie flashing of broken power lines. The juice failed in that particular area just as most of us arrived, so the session went on by candlelight, and the ten adventurers present, some of whom had come 20 miles or more, chewed things over in customary fashion. As one of those present remarked, "Wonder what my reply would have been, if my wife had asked me to take her shopping on a night like this?!"

Dean Flower, Richmond Mich., sent a pic of his veteran Rudderbug, which has had about (*Continued on page* 17)



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Flying Wing Sailplane Highlights National Meet

FLYING WING sailplane pictured above is the Horten IV flown by the German pilot Rudolph Opitz at the last National Soaring Contest at Dallas, Texas. Opitz, now working at Wright Field, was one of the test pilots who flew the Messerschmitt Me 163 rocket fighter. Horten IV has a wingspan of 65 ft. 5 in. and aspect ratio of over 20. Pilot lies in semi-prone position. Best flight during Nationals was 319 miles.

★ ★ ★

YOUNGEST soaring pilots at last National Soaring Contest were 15-year-old Doug Bradley of Tupelo, Miss., and Larry Gehrlein, Jr., 16, of Erie, Pa. Larry has the distinction of being probably the youngest Silver "C" pilot in the world, and is a member of the famous "Flying Gehrlein" family, of which Larry Sr. and Ma Gehrlein are also pilots. Young Doug Bradley, an ardent model builder, learned to fly when 11 years old. His best flight during contest was 90 miles.

★ ★ ★

HANDLEY PAGE, builders of the radical H.P. 80 Crescent wing bomber (see World A-Wing) will produce a commercial jetliner of same shape. Plane, to be designated H.P. 97, will have a capacity of 50,000 lbs., carry as many as 150 passengers and be capable of flying from London to New York, 3455 miles, in 6½ hours. . . . DOUGLAS C-118A LIFTMASTER, first recently delivered to AF, has more cargo capacity than the largest railroad car. . . . AIR FORCE personnel attatched to AF Missile Test Center, Cocoa, Fla., assigned to course of guided missiles training at Bell Aircraft Corp., Buffalo.

★ ★ ★

LOSS of two night bombing B-29s in Korea shot down by rocket-firing Communist fighters confirms the warning and rumors that Red China is getting Russian radar-equipped night fighters. . . . FLETCHER FD-25 Defender armed lightplane to be built in Japan. . . . ELECTRONIC system in a modern guided missile is capable of "thinking" at a rate 10,000 times the speed of human brain. . . . THE GYROSCOPE may soon become the central brain system for guided missiles and pilotless aircraft. Important advances made in design and construction of the "spinning top" have almost eliminated ills which hounded the device. Unlike the electronic system, it cannot be jammed and its unerring accuracy will permit pinpoint accuracy when homing on target as well as automatic navigation to any point on the earth. Already a gyroscopic device called "Polar Path Control" is in use for polar navigation, where severe magnetic disturbances make flight by magnetic bearing impossible.

★ ★ ★

JAPANESE newspaper, Mainchi Press, purchased a Bell 47D-1 helicopter to help gather news. . . . A FAIRCHILD C-119 military transport recently attained an altitude of 30,300 ft. during flight test at Hagerstown, Md., plant. . . . F4U-7, latest and last of the famous Corsairs now being delivered to the French Navy. Since 1940, when the first Corsair came off the production line, the Chance Vought company has delivered 12,571 bent-wing fighters. . . . AIR FRANCE will put in service its three de Havilland Comet jetliners in June. With its twelve Vickers Viscounts, the Comets and Super Constellations, Air France will have one of the most modern fleets of airliners in the world.

★ ★ ★

A NUMBER of Fairey Gannett anti-submarine planes powered by Double Mamba turboprop engines ordered by Royal Australian Navy. . . . "MY BROTHER BILL," the life of Gen. Billy Mitchell, whose fight for a bigger and better Air Force is an integral part of American history, vividly told by his sister Ruth Mitchell. Book published by Harcourt Brace & Co., 383 Madison Ave., N. Y. City.

Two Soaring passengers (see text): left, Larry Gehlein, Jr.; right, Doug Bradley, at Dallas.

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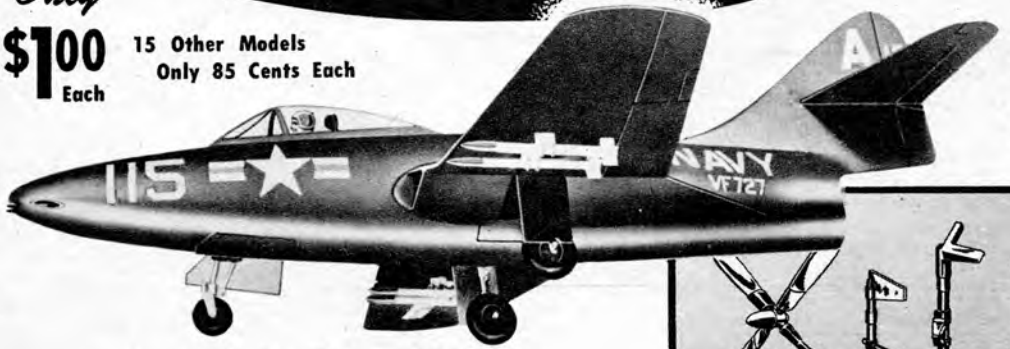

Panther Jet F9F • Kit G-16

One of U. S. Navy's finest carrier based jet fighters. Doing a terrific job in the Korean conflict. Note the exceptional detail shown in this photo of an actual model assembled from a Speedee-Bilt kit.

Illustration shows some parts from these Speedee-Bilt kits: Plastic props, canopies, rockets, tail and nose wheels, pilots, cowls, nose pieces, exhausts, etc. Also Monofoil balsa wings, prefab balsa fuselage, shaped balsa cowling, tail parts, etc.

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Some of these parts illustrated at the right.

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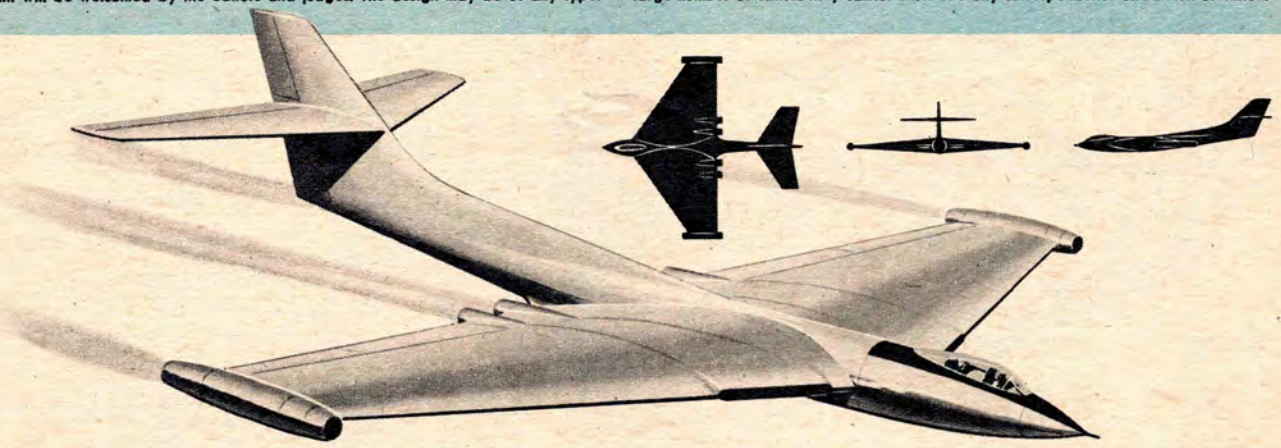
AIRMEN OF VISION DESIGN COMPETITION

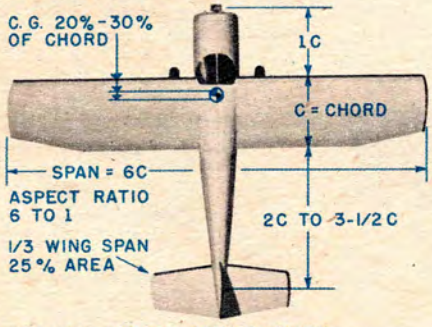
Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½x11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type: commercial aircraft, military planes, (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payment of $5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



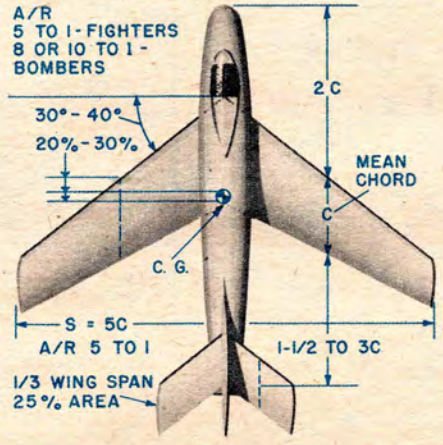
BEST DESIGN OF MONTH: Air Force S/Sgt. Wm. R. Kneller, currently overseas (3rd Shoran Flight, APO 83, Postmaster N.Y.C.) gets first honors this month for his long-range bomber or transport design. It is powered by six jet engines, four in wings, two at wingtips, each 10,200 lbs. thrust. Two radar-guided air-to-air missiles. As transport: clamshell doors in nose, elevator in wings. Span 180 ft.

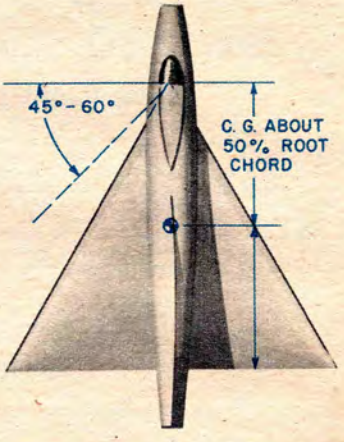
LOADING AND SPACE REQUIREMENTS for crew, passengers, bombs, guns, freight, powerplant and fuel form an important consideration in your design. Location of various parts determine C.G. (center of gravity) and this location has definite limits as shown. Grouping all engines in tail of a bomber, for instance, would not make a flyable design, so try to keep all heavy items such as engines, fuel, bombs, etc., near C.G. or balanced evenly around it. Here are outline dimensions of some of the elements that must be considered. The general engine types are shown with dimensions of the largest used at present. Allow enough space for your powerplants.

BASIC PROPORTIONS

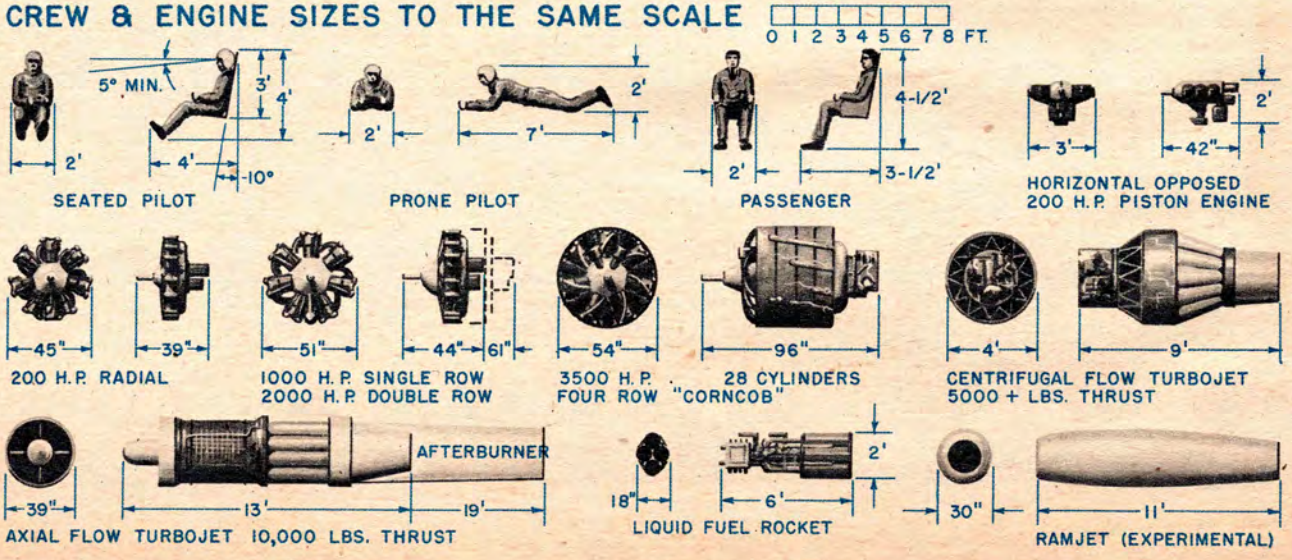


TYPICAL ASPECT RATIOS (A/R)
5 TO 1 - FIGHTERS, RACERS
6 TO 1 - LIGHTPLANES, FIGHTERS
8 OR 10 TO 1 - TRANSPORTS, BOMBERS





CREW & ENGINE SIZES TO THE SAME SCALE



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2. If application is accepted, the Air Force will give you a physical examination.
3. Next, you take a written and manual aptitude test.
4. If you pass your physical and other tests, you will be scheduled for an Aviation Cadet training class. The Selective Service Act allows you a four-month deferment while waiting class assignment.

WHERE TO GET MORE DETAILS: Visit your nearest Air Force Base or Air Force Recruiting Officer. Or write to: Aviation Cadet, Headquarters, U. S. Air Force, Washington 25, D.C.

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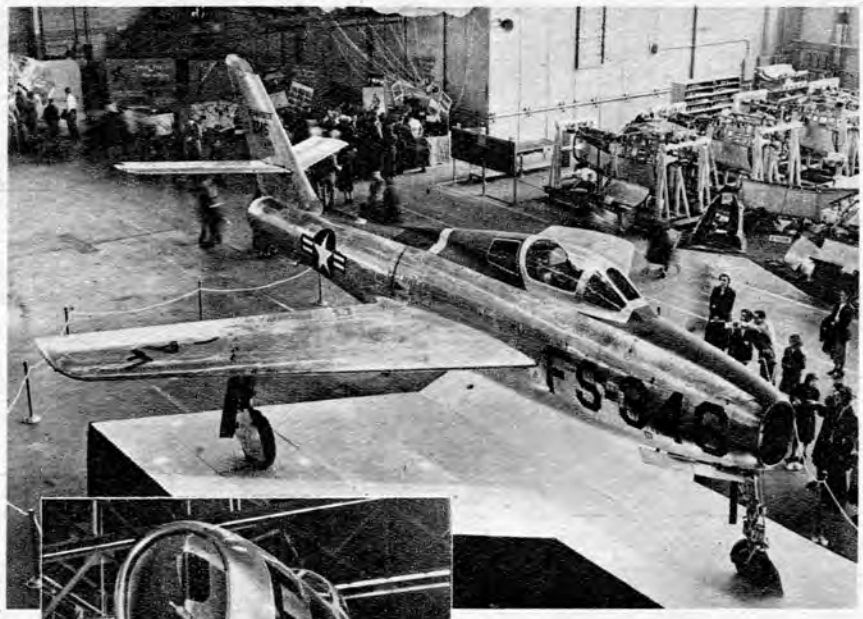
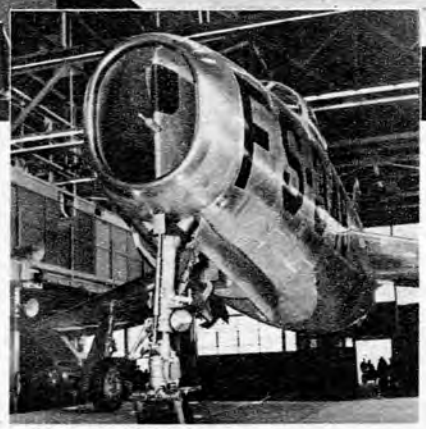
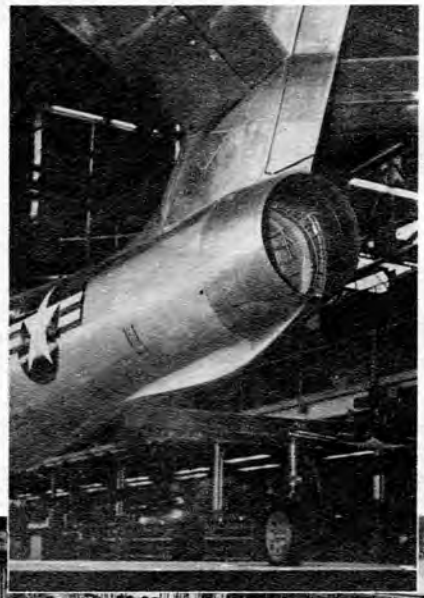




F-84F
THUNDERSTREAK

From Republic Aviation's plant at Farmingdale, L. I., the swift, swept-back F-84F Thunderstreaks are rolling out in increasing numbers. Although based on experience with the familiar F-84 Thunderjet, the "F" has been completely redesigned. Wings and tail swept 35 degrees, air intake duct changed, the cockpit canopy swings upwards and the fuselage was deepened to take the more powerful Wright J-65 Sapphire engine which develops 7200 lbs. thrust. Weight empty is over 11,000 lbs. Speed around 700 mph. (Levy-Shipp photos)



R/C

(Continued from page 10)

350 flights since it was built in the spring of 1950. He comments that he has been sending pix to model magazines for years, but none of them has ever been printed. Well, sad to say, *this* can't be used either, for it is a rather dull print. We can see Dean clearly, squatting behind his Bug, but by the time the pic got through the reproduction process, our readers would hardly be able to make him out. Incidentally, he makes a comment to which most R/Cers will add amen; he feels that R/C flying "is the King of Sports, but you have to be a King to afford it." Not entirely true, but just the same—Amen.

George Trammell writes that following our mention of him here last spring, he received several calls from interested builders, and had the busiest season of R/C ever, last summer. Several of the callers had been flying R/C within a few miles of his home, yet they hadn't heard of each other. George did fine with a little .09 ship, until he put her in a three-turn spiral to lose some altitude—sez that was his fifth folding wing job in two years! He now has a 54" span plane built around a Cumulus wing; it has rudder and elevator, and will have throttle too, if he can just find some place to stuff in the motor control escapement. Who says you can't get multi-control in a small ship?

Contest News. A joint meet of the New England Wakefield Group, Norwood S.M.E., and Tech Model Aerocrafters featured an R/C event, winners of which were: 1. Bill Dean (Winchester, Mass.), modified CQ with Arden .19 and Walker pressure tank; Macnabb radio operating twin rudders. 2. Len Poor (Boston), modified Super Brigadier with O&R .19, Macnabb radio and Bonner esc. operating twin rudders. 3. Lou Andrews (Norwood), Trixter Beam with McCoy .09.

Another R/C event was the Pylon Race—the first time this has been tried in competition, to our knowledge. The pylons were first laid out in a triangle one-third mile apart, but this was found to be too far for good control, so they were changed to one-sixth mile, thus requiring two laps to a mile. Unfortunately the day was very windy and the only two flyers to try the course had a tough time of it. Winner was Bill Dean, whose actual time was 12 mph. Lou Andrews made it with an average speed of 10 mph.

The low speeds came from the fact that the contestants had to spiral on the upwind leg to keep their ships at a reasonable altitude. Here's a spot where elevator would really pay off!

A meet held by the Baltimore Model Aero League produced these winners: 1. Alvin Rickert (Glen Burnie, Md.). 2. Jim Martin (Kensington, Md.), Rudderbug. 3. Brayton Paul, (Baltimore), low wing "Flyball Special." Brayton, who sent us this info, has named his ship thus because of the motor-driven flyball arrangement he uses to get proportional control. He also noted that a meet at Lancaster, Pa., a few weeks previous was won by Jim Martin, with John Klopp of Baltimore second.

Fourth Annual Free Flight Meet by the

(Continued on page 52)

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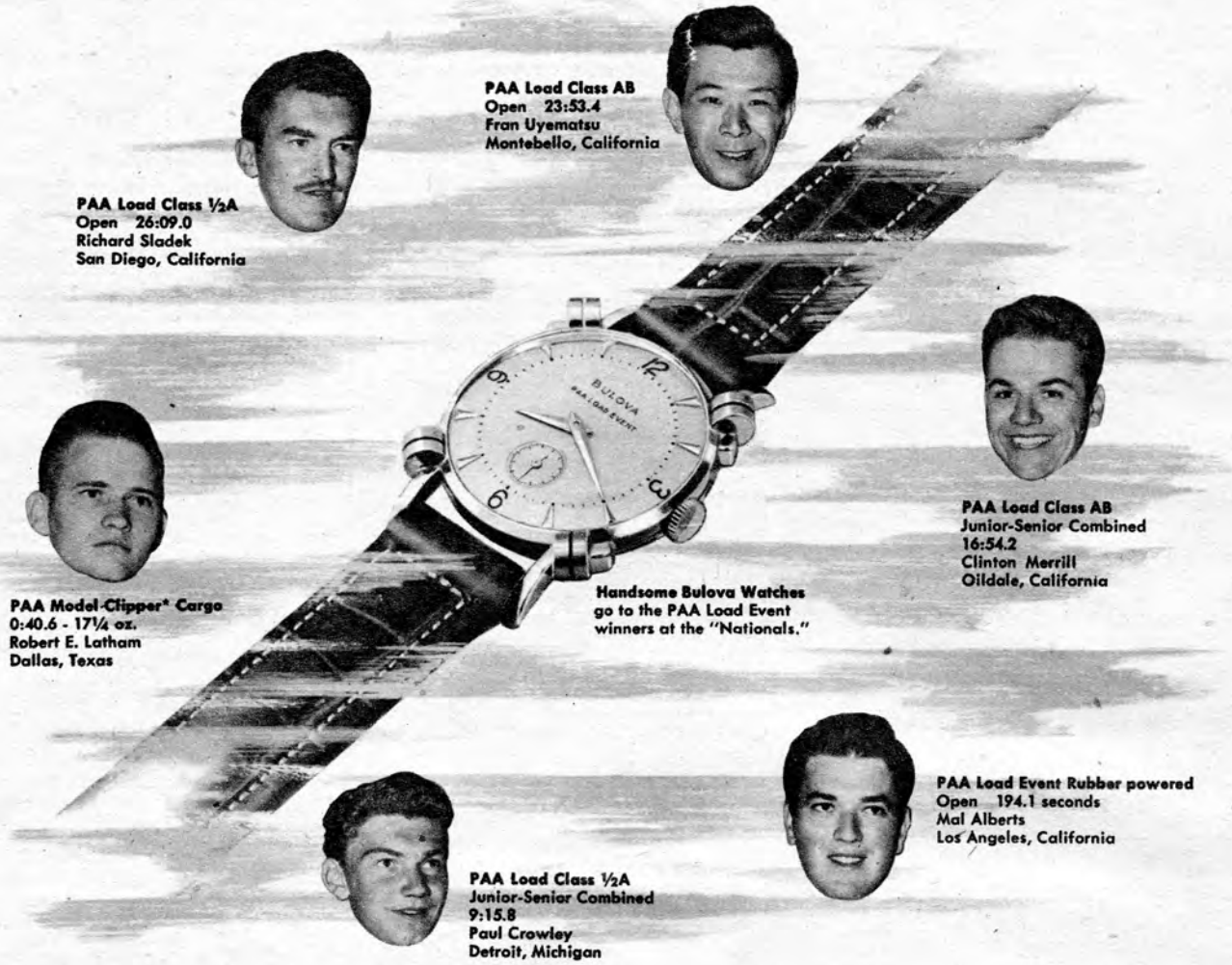
at the 1952 "Nationals"



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Arctic based La-17 jet fighters of the PVO (Anti-aircraft Defense) are equipped for in-flight refueling. System is the "probe and drogue."

The Red Air Force Is Ready—1

Razor sharp, Soviet air might is capable of attacking us NOW. Here's latest dope

By WILLIAM GREEN—Illustrated by ROY CROSS

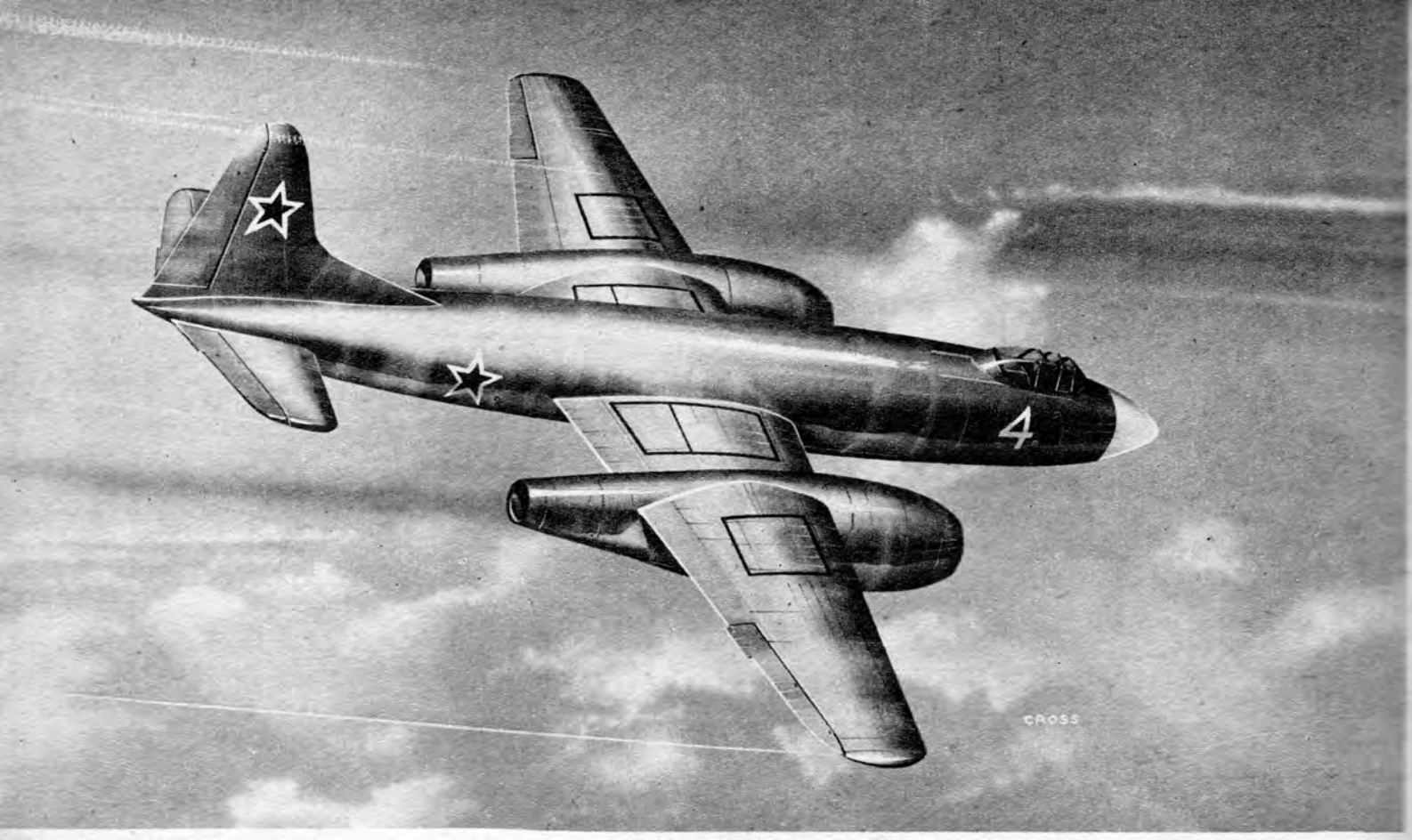
■ According to Western air intelligence estimates, the overall first-line strength of the Soviet Air Fleet is currently 20,000 combat airplanes, a figure that has remained relatively unchanged for the past two years. But the ratio of piston-engined airplanes to jets has altered radically. Two years ago it was roughly 80-20 in favor of piston-engined planes; the scales now weigh heavily in favor of jets. About 7,000 combat airplanes are based in the deployment belt formed by Russia's satellites. European Russia and Siberia house a further 8,000. The remaining 5,000 are based in Far Eastern areas.

Another 20,000 airplanes of various types are in second-line reserve, and to be taken into account when assessing Red numerical strength are the air arms of the countries within the Soviet orbit. Add to the Soviet Air Fleet the satellite air arms and we point up the first-line strength of the Communist sphere to around *25,000 combat airplanes.*

The conception of Russia as a land army power possessing air forces solely for the purpose of tactical support is now a myth. The Soviet Air Fleet or *Sovietski Voenno-Vozdushni Flot,* commanded by General-Polkovnik Pavel Zhigarev, remains tactical in concept and subservient to requirements of the Army, but on this army-support concept of air power have been superimposed both a powerful strategic striking force, geared for trans-polar warfare, and a home-defense organization, now re-worked to counter U. S. bombing attacks even on a round-the-clock basis.

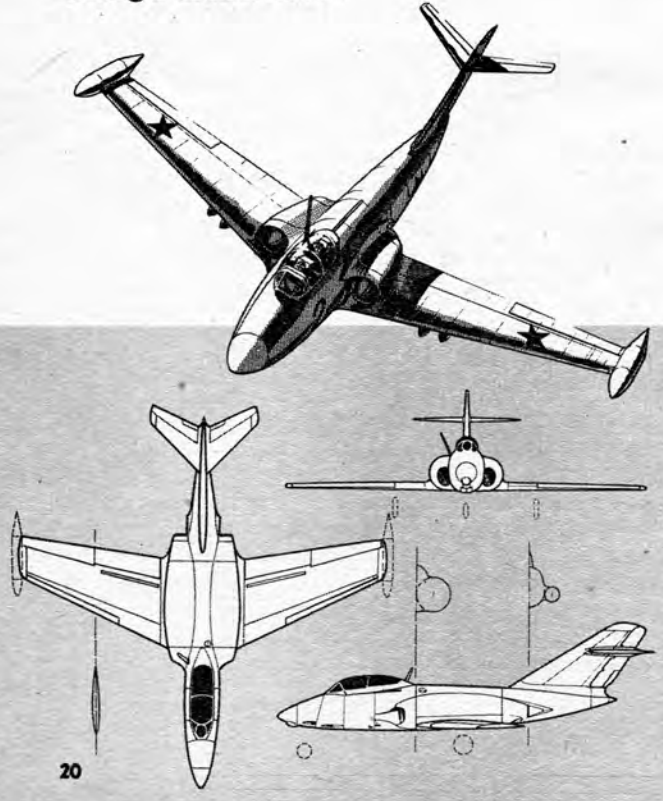
In the past two years, Russia's strategic striking force, the *Aviatsiya Dalnyevo Deistviya,* or ADD, has gained considerable autonomy. Its expansion and modernization program has received *top priority.* Very conscious of the polar concept of air warfare, the ADD is largely concentrated in the Arctic, for the shortest routes for Soviet bombers headed for U. S. industrial centers lie across the North Pole.

Russia is far ahead in the race to develop Arctic bases. Commanded by General A. Ye Golovanov, the ADD uses a chain of bases stretching across Russia's Arctic Circle belt, from Murmansk in the West to the Anadyr airfield complex in the East. Possessing at least two fields on Novaya Zemlya, straddling the 75th parallel, the ADD has bases on the Taimyr peninsula and in the New Siberian Islands, also lying across this parallel.



This is a provisional drawing of a Soviet light attack jet bomber. Craft is believed to be designed by Ilyushin and is known as Type 35.

Mainstay of Red Vozdushni Sili (Air Force) is a variety of jet planes featuring advanced design know-how



All-weather fighter designed by A. J. Mikoyan. Span, 41'; length, 43'. The two-seater was spotted in the skies over Eastern Germany.

Further bases are under construction on the island of Servenaya Zemlya and on Frans Josef Land, both of which lie across the 80th parallel.

At the present time the standard Russian strategic bomber is the Tupolev Tu-4, a "pirated" copy of the Boeing B-29. Some 1,500 of these bombers are currently available to the ADD; sixty percent of this strength is in the Arctic area, the remainder being situated for attack against Western Europe, the Mediterranean area and the Far East.

The Tu-4's *normal* operational radius is unlikely to exceed 2,000 miles—insufficient to meet the ADD's trans-polar requirements—but the successful development of in-flight refueling techniques has eased the immediate problem facing Soviet planners for, with recourse to this system, the ADD *can* attack North American cities with *its present Tu-4 bomber equipment.* In-flight refueling trials were first undertaken in Russia in 1946, and this equipment, based on that development by the British, is now a standard fitment of Tu-4 bombers of the strategic striking force. Of the 900-plus Tu-4s based in the Arctic belt, one in five is a tanker aircraft, two attached to each squadron.

Refinements have brought late production Tu-4s into the B-50 category; the 2,100 hp ASh-90 radials (direct copies of the Wright R-3350) have been replaced by M-300 radials designed by Arkadii Shvetsov and giving upwards of 3,200 hp each, overload fuel tanks have been slung outboard of the engine nacelles, and armament and tail surfaces have been revised.

Russia's global bomber destined to replace the Tu-4 with ADD formations and referred to by Western intelligence under the code designation *Type 31,* is known to

Two variants of the Il-28. In background is the attack bomber and in foreground the night fighter version with closed, radar-equipped nose.

have commenced flight trials during 1951. A pre-production batch of ten-fifteen machines is undergoing service evaluation, but *Type 31* will not be available in quantity *much before 1954.* Power plants are reported as turbo-props derived from German wartime designs, plus jet pods for take-off and combat boost. Cruising speed is believed to be of the order of 450-470 mph, and maximum range, 8,000 miles.

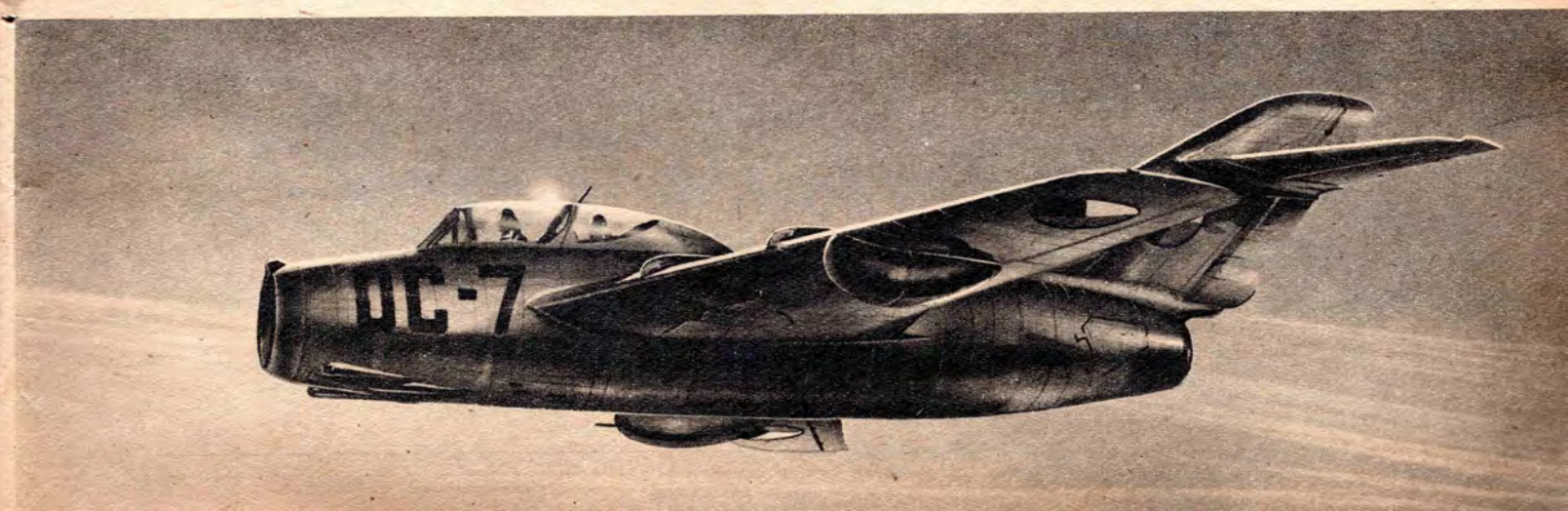
To counter the threat of attack by our own Strategic Air Command, the Reds have placed emphasis on the evolution of a closely knit air defense network embracing all Russia's strategic centers. Known as the *Protivovozdushnaya Oborona,* or PCO, the defense forces, like the ADD, wield a certain amount of autonomy. The PVO is responsible for the continental and metropolitan early warning chains, the anti-aircraft artillery, and large interceptor fighter formations.

Commanded by the Premier's son, General-Major Vasilli Stalin, the PVO fighter pilots are considered the elite of the Soviet Air Fleet, and the equipment requirements of the PVO are given the very highest priority. With the polar concept of air warfare always uppermost in mind, the Russians have positioned the largest PVO interceptor formations at an arc of airfields across the Arctic belt as a barrier against attack from Alaska.

The Soviet radar screens as yet cover only some of the approaches to industrial centers, but the high standard of Russian early warning and GCI radar has already won the respect of U. N. forces in Korea, as have the radar searchlight and anti-aircraft artillery control.

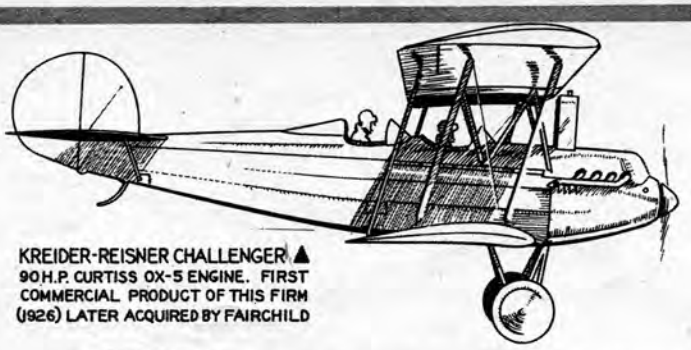
The majority of the day interceptor forces of the PVO, and, for that matter, the Soviet Air Fleet as a whole, are MiG-15 equipped, although northern-based PVO units reportedly use the longer-ranging and faster Lavochkim La-17 which is now known to be fitted with an afterburner. Certain La-17- (*Continued on page* 58)

Trainer version of the famous MiG-15 designated as U-MiG-15. Widely used by Soviet AF. It is seen here in Czechoslovakian AF insignias.

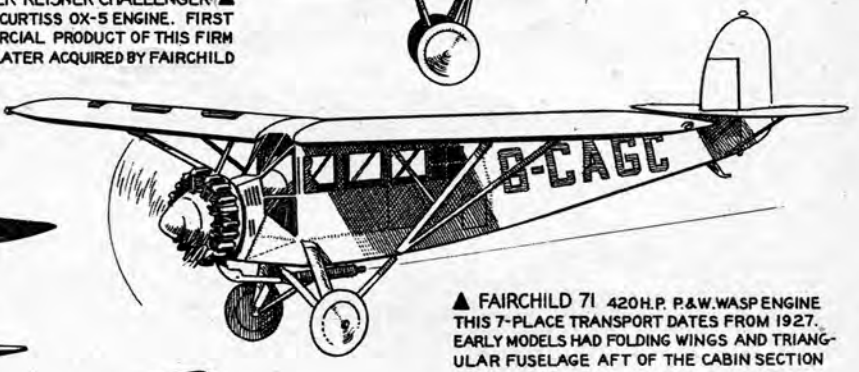


AIR PROGRESS

By DOUGLAS ROLFE

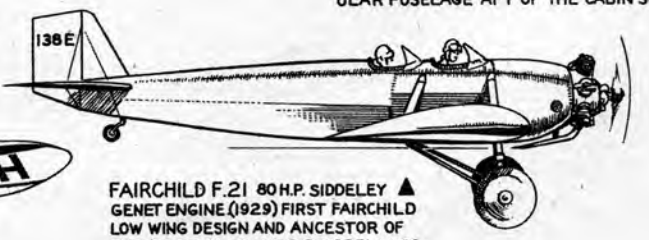


KREIDER-REISNER CHALLENGER ▲ 90 H.P. CURTISS OX-5 ENGINE. FIRST COMMERCIAL PRODUCT OF THIS FIRM (1926) LATER ACQUIRED BY FAIRCHILD

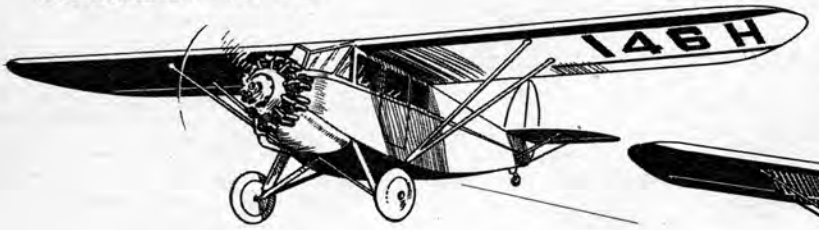


▲ FAIRCHILD 71 420 H.P. P&W. WASP ENGINE THIS 7-PLACE TRANSPORT DATES FROM 1927. EARLY MODELS HAD FOLDING WINGS AND TRIANGULAR FUSELAGE AFT OF THE CABIN SECTION

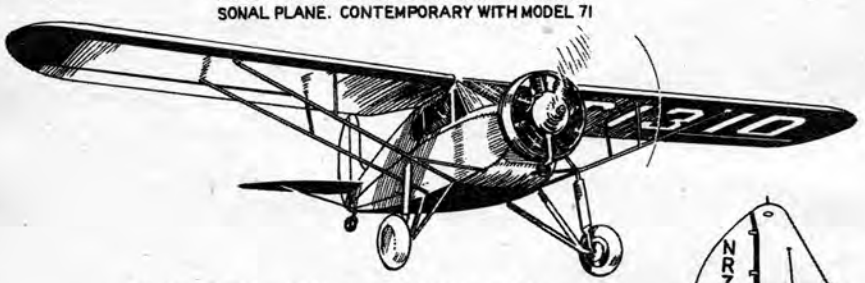
FAIRCHILD KR-21 90 H.P. KINNER ▲ ENGINE. 2-PLACE SPORTS TRAINER. ALSO ACQUIRED FROM KREIDER-REISNER



FAIRCHILD F.21 80 H.P. SIDDELEY ▲ GENET ENGINE (1929) FIRST FAIRCHILD LOW WING DESIGN AND ANCESTOR OF THE FAMED WORLD WAR 2 MODEL M-62

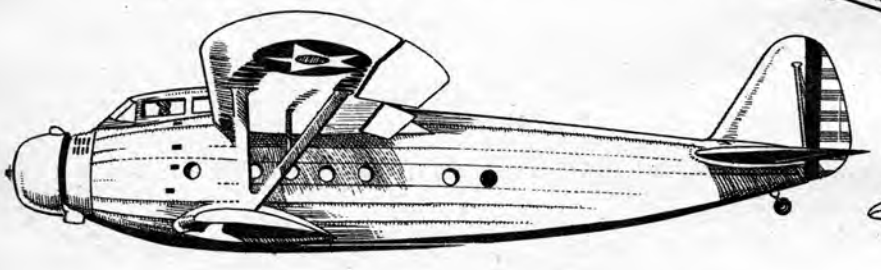


▲ FAIRCHILD F.42 300 H.P. WRIGHT J-6 ENGINE FIRST FAIRCHILD APPROACH TO THE 4-PLACE PERSONAL PLANE. CONTEMPORARY WITH MODEL 71

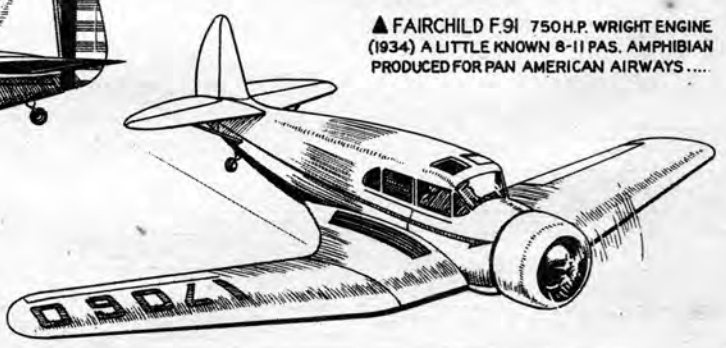


▲ FAIRCHILD F.22 75 H.P. 4-CYLINDER AIR-COOLED ROVER ENGINE. THIS 2-PLACE OPEN COCKPIT SPORTS TRAINER APPEARED IN 1931.

FAIRCHILD F-24 125 H.P. WARNER SCARAB ENGINE ▲ PROTOTYPE OF THE EXISTING MODEL F.24 THIS WAS A TWO-PLACE AIRPLANE WHEN IT FIRST APPEARED (1932)



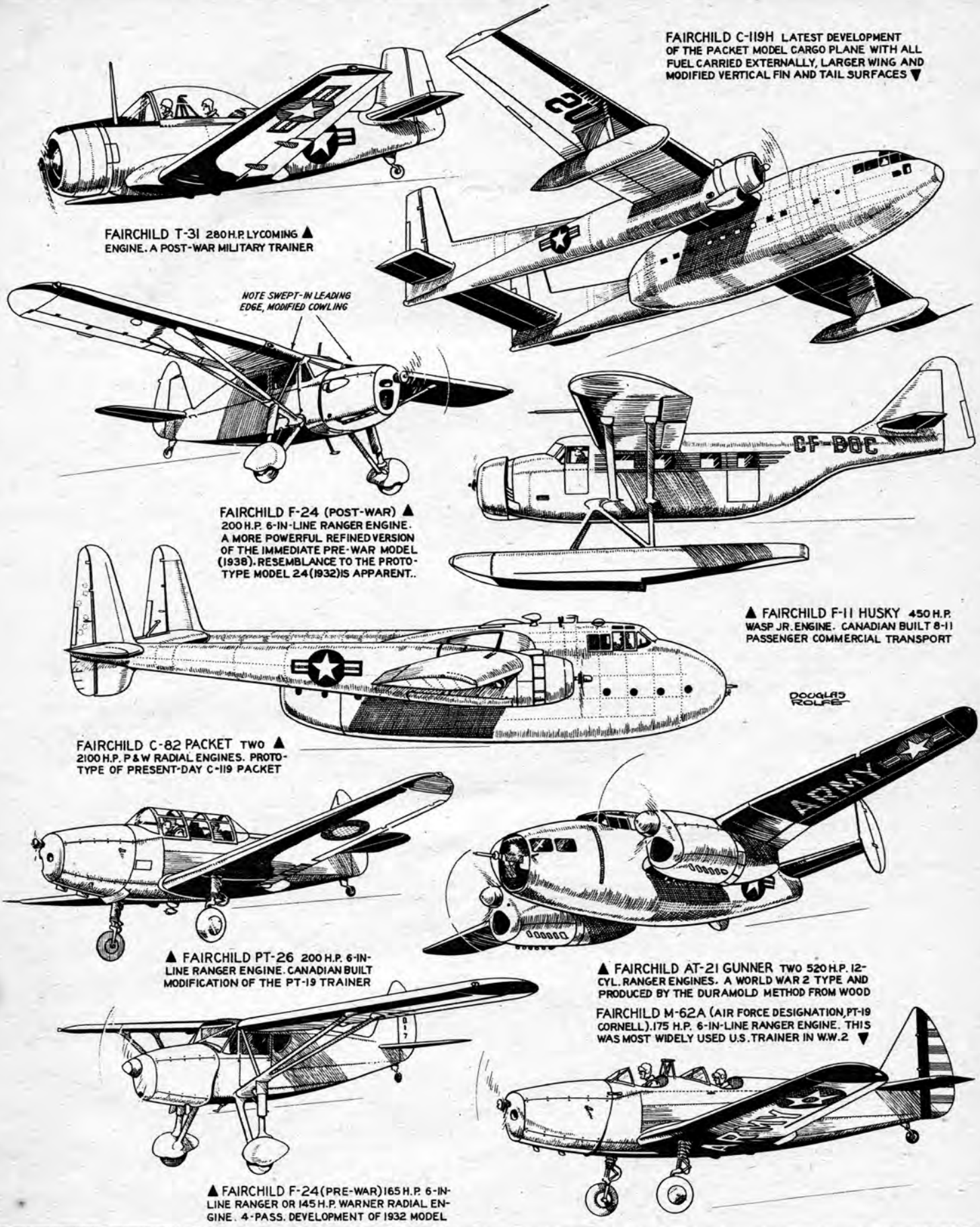
▲ FAIRCHILD F.91 750 H.P. WRIGHT ENGINE (1934) A LITTLE KNOWN 8-11 PAS. AMPHIBIAN PRODUCED FOR PAN AMERICAN AIRWAYS....



FAIRCHILD KR.XC.941 (C-31) 750 H.P. WRIGHT ENGINE. (1934) FIRST ▲ FAIRCHILD DEVELOPMENT IN THE MILITARY CARGO AND TRANSPORT LINE

FAIRCHILD F.45 350 H.P. WRIGHT WHIRLWIND ENGINE. (1935). THIS 5- ▶ PLACE PERSONAL PLANE PRODUCED 18 YEARS AGO CRUISED AT 155-60 MPH AND COMPARES FAVORABLY WITH THE BEST IN THIS CLASS BUILT IN 1952

THE FAIRCHILD STORY. The Fairchild company started out as the Fairchild Aerial Surveys back in 1923, manufacturing aerial cameras and conducting extensive aerial surveys. Unable to find a suitable aircraft to fly cameras, its founder, Sherman Fairchild, formed the Fairchild Aviation Co., at Farmingdale, L. I., where the first truly camera planes, the FC-1s, were designed and manufactured. So successful were these aircraft that subsequent improved versions, with more powerful engines, the FC-2 and model 71, played an important part in the development of the aerial transportation system in this country as well as in Canada and South America.

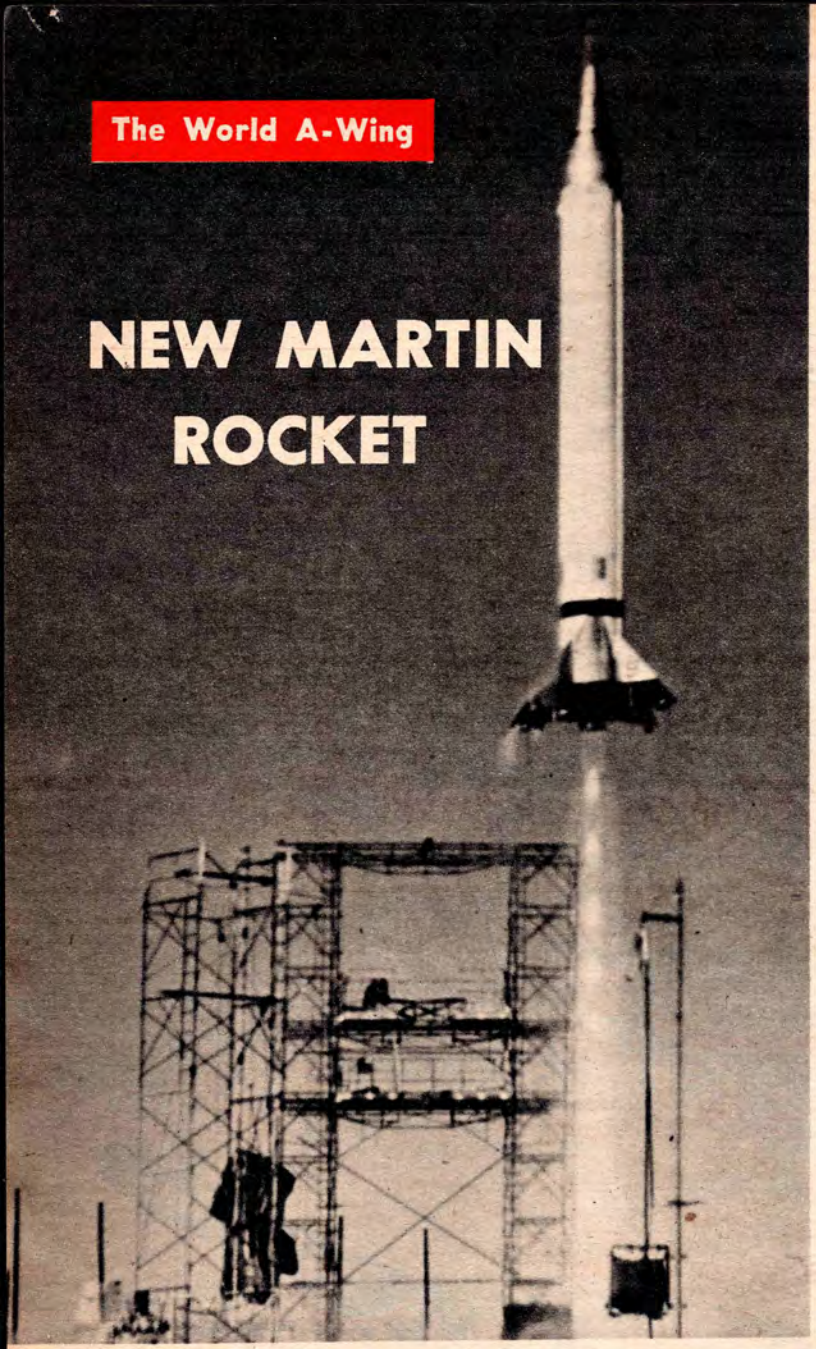

FAIRCHILD C-119H LATEST DEVELOPMENT OF THE PACKET MODEL CARGO PLANE WITH ALL FUEL CARRIED EXTERNALLY, LARGER WING AND MODIFIED VERTICAL FIN AND TAIL SURFACES ▼
FAIRCHILD T-31 280 H.P. LYCOMING ▲ ENGINE. A POST-WAR MILITARY TRAINER
NOTE SWEPT-IN LEADING EDGE, MODIFIED COWLING
CF-BOC
FAIRCHILD F-24 (POST-WAR) ▲ 200 H.P. 6-IN-LINE RANGER ENGINE. A MORE POWERFUL REFINED VERSION OF THE IMMEDIATE PRE-WAR MODEL (1938). RESEMBLANCE TO THE PROTOTYPE MODEL 24 (1932) IS APPARENT..
▲ FAIRCHILD F-11 HUSKY 450 H.P. WASP JR. ENGINE. CANADIAN BUILT 8-11 PASSENGER COMMERCIAL TRANSPORT
DOUGLAS ROLFE
FAIRCHILD C-82 PACKET TWO ▲ 2100 H.P. P & W RADIAL ENGINES. PROTOTYPE OF PRESENT-DAY C-119 PACKET
ARMY
▲ FAIRCHILD PT-26 200 H.P. 6-IN-LINE RANGER ENGINE. CANADIAN BUILT MODIFICATION OF THE PT-19 TRAINER
▲ FAIRCHILD AT-21 GUNNER TWO 520 H.P. 12-CYL. RANGER ENGINES. A WORLD WAR 2 TYPE AND PRODUCED BY THE DURAMOLD METHOD FROM WOOD
FAIRCHILD M-62A (AIR FORCE DESIGNATION, PT-19 CORNELL). 175 H.P. 6-IN-LINE RANGER ENGINE. THIS WAS MOST WIDELY USED U.S. TRAINER IN W.W.2 ▼
ARMY
▲ FAIRCHILD F-24 (PRE-WAR) 165 H.P. 6-IN-LINE RANGER OR 145 H.P. WARNER RADIAL ENGINE. 4-PASS. DEVELOPMENT OF 1932 MODEL

Almost from the beginning the name Fairchild has been linked with not only planes but precision instruments, dependable aircraft engines and high quality aerial cameras.

In 1938 the Fairchild Company, foreseeing the need for a simple but practical military trainer, submitted the design of the M-62A model to the U.S. Army Air Forces. Under various labels, such as the PT-19 and PT-26, this airplane became one of the best known World War II Allied trainers, and apart from its excellence as an airplane had the great virtue of lending itself to rapid mass production. Wings were manufactured by means of the "Duramold" process, a Fairchild development.

The World A-Wing

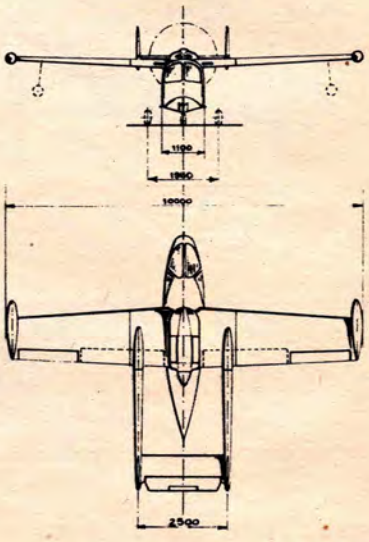
NEW MARTIN ROCKET



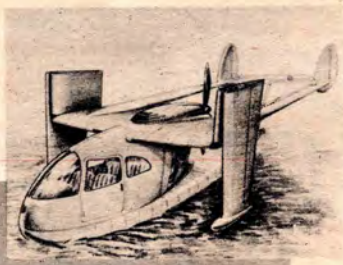
Martin Viking No. 9, research rocket. An improved version of Glenn L. Martin Co.'s high-altitude vehicle, Number 9 is some six feet shorter and of larger diameter. Most recognizable features are smaller triangular fins. Powered by 20,000 lb. thrust Reaction Motors liquid engine. At a recent launching at White Sands, N. M., reached altitude 135.6 miles, equaling previous altitude record for single-stage rockets.

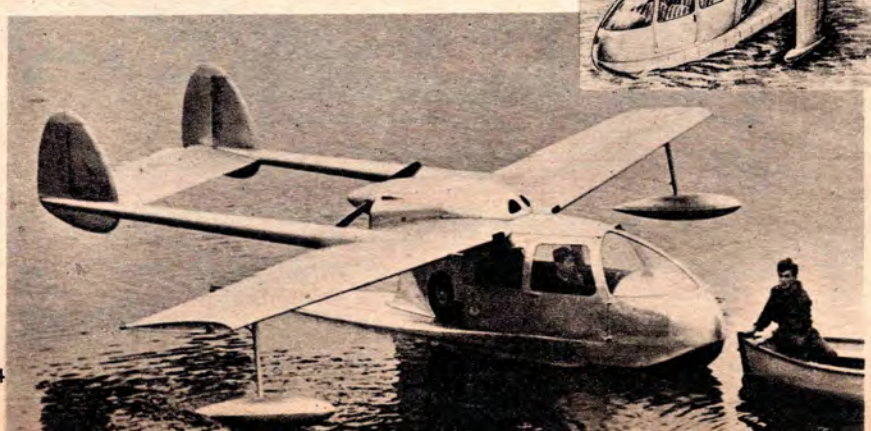
First American light jet trainer, the Cessna 318 which won AF design competition for jet primary trainers. Powered by two Turbomeca Marbores of 900 lb. thrust each. Span is 33 feet. Top speed around 400 mph.

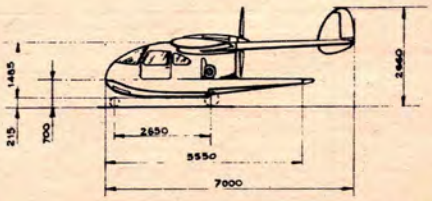
Cessna 310, light, twin-engine personal transport. Of all-metal construction, it carries four passengers and a pilot. All fuel is located in two wingtip tanks, not only adding safety but permitting a very clean design: the wing space usually occupied by tanks houses the main landing gear, hence the engine nacelles could be made smaller and flatter. The engines are two 225 hp Continentals; span 36' 1".



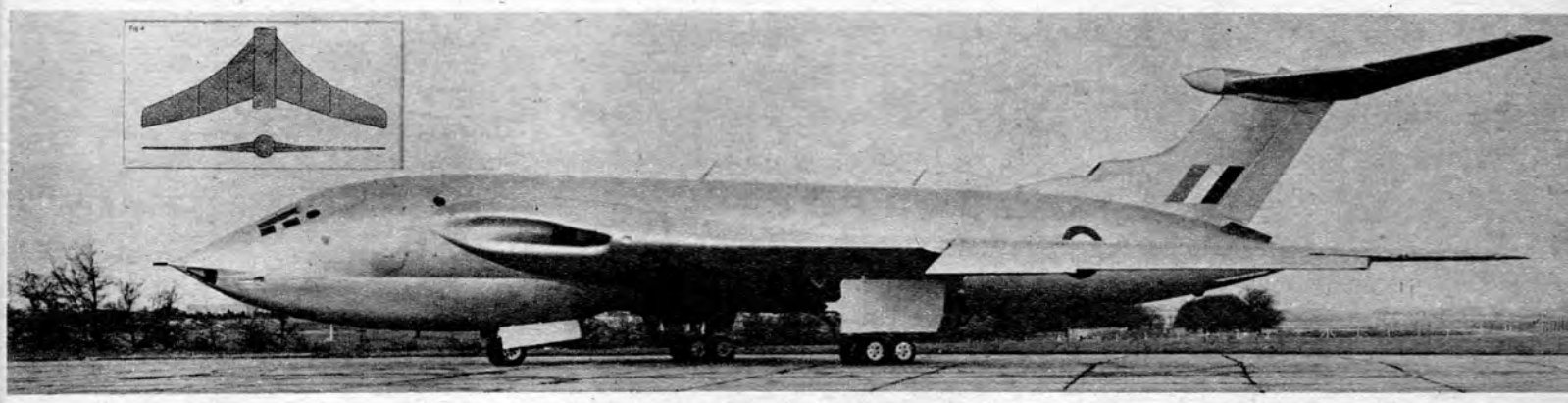
Nardi FN-333, a new Italian 3-place all-metal amphibian, to act as military liaison plane and as light personal transport. An unusual feature of the craft is the folding wings for taxiing through narrow areas and hangaring in boat houses. Shown here is the prototype powered by a 145 hp Continental. Another model will have a 225 hp engine.





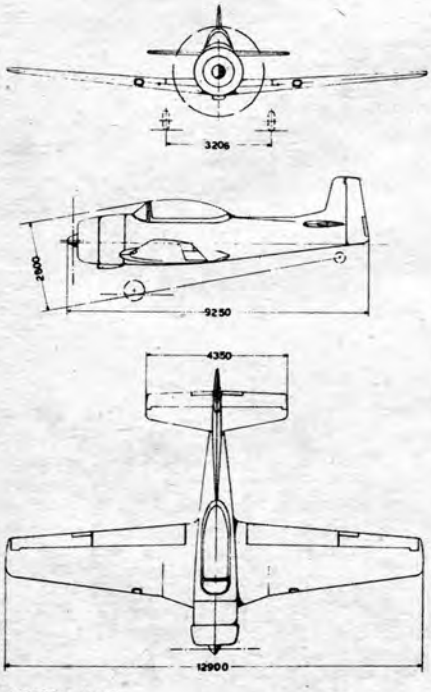


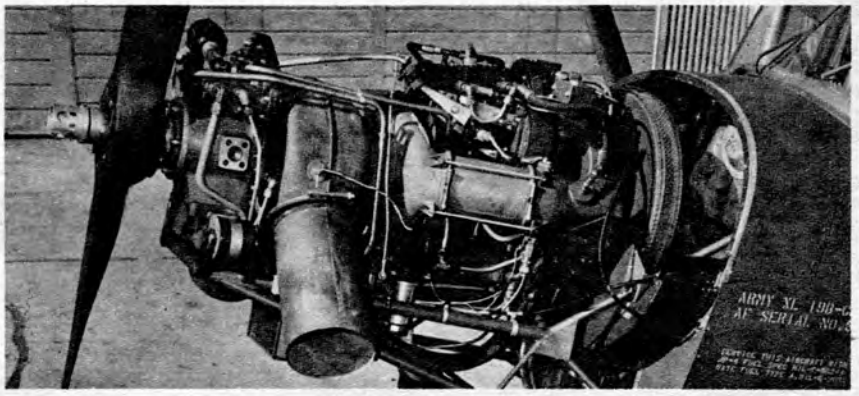
Latest newcomer to Cessna's highly successful line of single-engine airplanes is this model 180. The plane is equipped with a constant speed propeller driven by a 225 hp Continental engine giving it a cruising speed of 150 mph. The 180 seats four, has a luggage capacity of 120 lbs. Other features: "para-lift" flaps which reduce landing speed by 10%, are effective for short field take-off. Range is 4½ hrs.



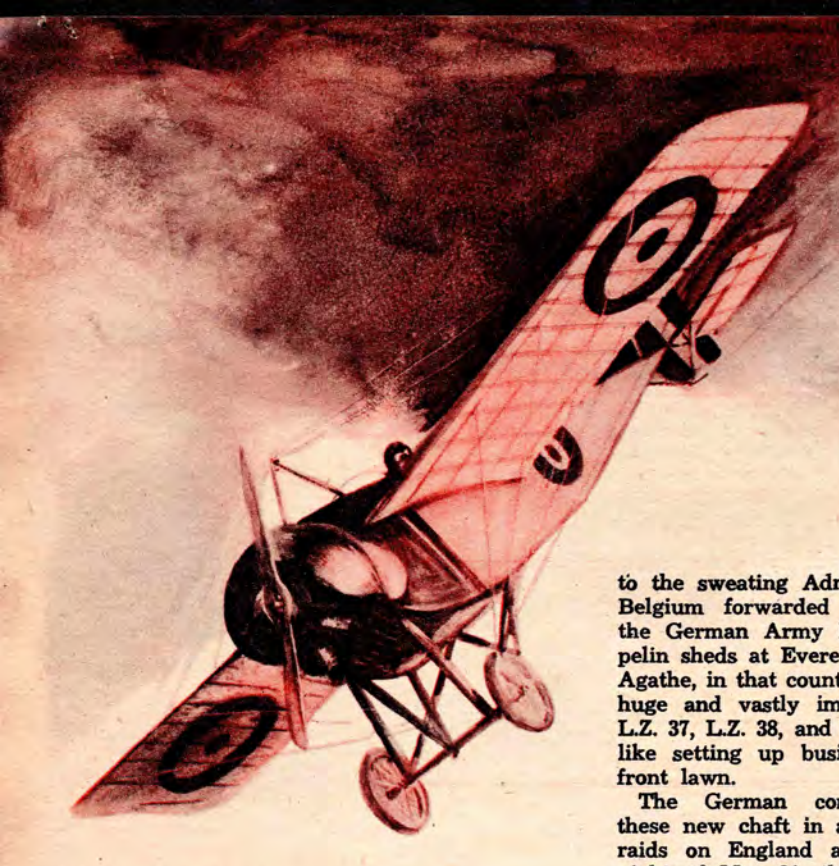
England's latest jet bomber, the Handley Page H.P. 80 featuring the radical crescent or scimitar wing. This shape combines advantages of both the swept and thin straight wing at high subsonic speed and high altitude, and gives good control at low altitudes. Because of greatly reduced drag better fuel economy is achieved and the range is extended. The H.P. 80 is powered by four Sapphires of 8200 lb. thrust each.

Below: Piaggio P-150, new Italian advanced trainer, shown here in three-view and photo, lower right, is somewhat reminiscent of the North American T-6. Powered by same type engine, 600 hp P&W R-1340. Span is 42 ft. 4 in., 237 mph tops, ceil. 25,200 ft., range 800 mi.





Experimental Boeing turboprop engine installation in a Cessna Bird Dog military liaison plane. Craft has designation of XL-19B. Powerplant develops 210 hp, weighs only 250 lbs., or 125 lbs. lighter than the conventional 212 hp engine of the standard L-19A. Because of the reduction in weight, the XL-198 has a very rapid and steep climb. The Boeing 502-8 turbine has been tested, in the last few years, in a variety of vehicles such as large trucks and Navy power boats, also as auxiliary powerplant, all with such good results that great changes portend.



With a pistol, a carbine and six tiny bombs, a valiant Royal Navy pilot sets out to battle the Kaiser's giant Zeps

By DONALD NAUGHTON

Death at Dawn for the L.Z. 37

■ This was no weekend war; it was a titanic affair of clashing giants, a war of survival. And Britain and her allies were starkly aware of it, back in bleak, early 1915. The pressure was on. Powerful, superbly trained troops of the German Imperial Army probed relentlessly at the wall of the Western Front, while German submarines prowled the Channel and the North Sea in a savage war of blockade.

Not content to rest on their land and sea efforts, the Jerries attacked through a new sphere: they hurled their Zeppelins into Allied skies. Capable of hauling huge loads of explosives for long distances at high altitudes, these flying leviathans were perfect weapons with which to smash at the sources of supply and to strike at civilian morale.

The first raid of the Zeps, though sudden, was clumsy and feeble. On the night of January 19, two Naval Zeps, the L. 3 and L. 4, blundered in over Norfolk and discharged their bomb loads. For the first time in history, bombs fell on the British homeland. They did little material damage, but four civilians died swiftly.

Additional raids, stronger and more cleverly executed, continued at intervals and public indignation soared at the inability of the Admiralty, charged with air defense, to contend with the menace. In April, more woe was added to the sweating Admiralty: agents in Belgium forwarded information that the German Army had erected Zeppelin sheds at Evere and Berchem St. Agathe, in that country, to house three huge and vastly improved Zeps, the L.Z. 37, L.Z. 38, and L.Z. 39. This was like setting up business on Britain's front lawn.

The German commanders tested these new chaft in a few skirmishing raids on England and then, on the night of May 31, the L.Z. 38 loomed high in the dark reaches above London and dropped over a ton of bombs on the sprawling metropolis in its baptismal bombing. And then it casually slipped away from the city's puny defense system, unseen.

The nation promptly roared its protest at the Admiralty. The theory of invulnerability that was slowly surrounding these extended gas bags threatened to have a serious effect on the war effort.

Tucked away in a corner, across the Channel, at Dunkirk, was No. 1 Squadron, Royal Naval Air Service. No. 1, equipped with an assortment of Avros, Moranes, Farmans and Bristols, low-powered, unarmed (of course!) delicate planes of that era, engaged mainly in reconnaissance duties (the specialized armed fighter, bomber and reconnaissance squadrons had not yet evolved). It also served as an outpost to warn of the approach of the Britain-bound Zeps.

The Zeps challenged the pilots of No. 1, intrigued them. They were unanimous in their desire to knock the huge aircraft out of the sky, but somewhat puzzled as to how this little feat could be accomplished. With no precedent to guide them, they set about the task with what makeshift devices and means they had at their disposal.

They got in their first licks on May 17. At 3 a.m., the L.Z. 39 was spotted off Dunkirk, knifing eastward. Two patrol planes of No. 1 were already aloft; seven more immediately took off to join them. Squadron Commander Spenser Grey and Flight Sub-lieutenant Reginald Warneford, armed with carbines, succeeded in closing in on the massive dirigible and were able to exchange a few shots with her before she nosed upward and easily outclimbed them.

Another squadron member, Flight Commander A. W. Bigsworth, subsequently encountered her and trailed her all the way to Ostend. The L.Z. 39 was pushing along at 10,000 feet, but by dint of skillful piloting, Bigsworth bulled his laboring 80 hp Avro to an altitude 200 feet above her massive length. He quickly released the four 20-lb. bombs his plane carried and dived away. Though she staggered under the impact of the explosives and smoke plumed from her stern, the huge craft continued to hold to her course and sailed steadily homeward, to Bigsworth's complete disgust. She reached her shed at Evere safely with one officer dead, several enlisted men wounded, and some slight hull damage.

No further opportunity for No. 1 to lock with the Zeps came until June 7, a day which was to be eventful in sky warfare. In the opening minutes of that day, Squadron Commander Grey stood in the darkness and gave final instructions to four pilots he had selected for a special mission. Flight Lieutenant J. P. Wilson and Flight Sub-lieutenant J. S. Mills, flying Farman biplanes, were to attack the Zep sheds at Evere; Flight Sub-lieutenant Warneford and another pilot (history does not record his name), flying Morane monoplanes, were directed to work over the sheds at Berchem St. Agathe.

Strangely, there now occurred one of those freakish incidents that leave so much to chance in any man's war. As the British pilots took off to bomb

the Army Zeps in their cradles, the same Zeps took off to join a flight of Naval Zeps at a rendezvous over France; the combined group was then to proceed to its target—England. The wheel of fate continued to turn, however. The L.Z. 38 developed engine trouble soon after take-off and returned to its shed at Evere. The remaining two military Zeps, the L.Z. 37 and the L.Z. 39, ran into fog, wandered about aimlessly, missed the rendezvous and finally nosed homeward.

Meanwhile, Wilson, too, encountered the fog, but he set a compass course and bored straight for Evere, arriving there shortly after 2 a.m. He was positive he was over his destination, but could see nothing in the inky blackness below. Then a searchlight beam suddenly stabbed up from the void and signaled a series of "longs," challenging him to identify himself. Wilson thought fast, thrust his Aldis lamp out of the cockpit, pointed it earthward, and obligingly snapped a series of "shorts." He grinned to himself as the great eye below promptly accepted him and winked out.

Easing down to 2,000 feet, he circled his Farman lazily for about fifteen mintes until the barest outlines of the Zeppelin shed began to emerge in the first pre-dawn light. And then he dived steeply; sweeping in over the target he cut loose the three 65-lb. bombs he carried and immediately glanced downward to observe the results.

The station came to life with a jolt. Almost at once anti-aircraft guns opened up. He was elated to see pillars of smoke streaming from the shed, but a closer inspection failed to reveal the tell-tale sign of flame. His raid had failed, he muttered angrily to himself as he ruddered his craft away from the hail of fire leaping skyward.

His companion, Flight Sub-lieutenant Mills, innocently wandered in over the shed about ten minutes later and was immediately surrounded by flying lead. Mills whipped away, climbed to 5,000 feet, and returned at top speed. Over the shed he dropped his four 20-lb. bombs. A few seconds later, artificial daylight suddenly illuminated the scene below as the bombs bull's-eyed through the roof of the shed and disintegrated the L.Z. 38 in a tremendous burst of flying flame and smoke that could be seen for miles.

Mills didn't wait for a second look; he kept right on going. He ran into fog and several hours later landed on the beach between Calais and Dunkirk. Wilson, incidentally, roamed around in the same fog and landed safely at Boulogne, after spending a total of five hours in the air!

While these two had been putting on a show for the Jerries at Evere, Flight-lieutenant Warneford and his companion were occupied with their own problems. The latter pilot had foul luck; his instrument lights failed, he promptly got lost, and at last crash-landed near Cassel. He escaped injury.

Warneford, flying toward his destination, the sheds at Berchem St. Agathe, was calmly appraising his chances for a (*Continued on page* 62)

Half-A PAA-Load Winner:
Top National Plane

By RICHARD R. SLADEK

Full-size working drawings for constructing this model, plus many other outstanding contest and scale model craft are available from "AT's" Plan Dept. See back-of-book list

■ *Pay Up* was developed from two earlier Half-A payload models. The forerunner of the *Pay Up* was designed and built early in the spring of 1951. It featured a monocoque sheet balsa fuselage with a one-wheel landing gear. The wing had an area of two hundred square inches and an aspect ratio of six to one. An Eiffel 400 airfoil was used for the wing section and a Clark Y for the horizontal tail section. The model was powered by a Torpedo .049 and had a good climb and glide with a three-ounce dummy.

A second payload model was built a few months later. It was similar in design and construction to the first. The only exception was that it had a higher aspect ratio wing and a two-wheel landing gear. A Joukowski airfoil was used for a wing section and a Clark Y airfoil for a horizontal tail section. The wing area was again two hundred square inches. This model had a better glide than the first, but the rate of climb was lower. Both these models placed in several Half-A PAA-Load contests in Southern California.

Finally *Pay Up* was designed and built in the spring of 1952 to meet new 1952 Pan American World Airways weight lifting rules. Since a four-ounce dummy was required, the model was designed with a larger wing area to produce a good glide with a low sinking speed. Test flights proved that it had an excellent glide and a fair climb.

Basic concepts behind the design of the *Pay Up* were first, that the model had to be aerodynamically efficient; second, it must be simple in design and construction, and third, it must be rugged enough for contest flying.

To gain the maximum aerodynamic efficiency, a high aspect ratio wing was selected because of the better lift-over-drag characteristics of a high aspect ratio wing. Tapered wingtips were used to reduce the wingtip vortexes to a minimum, thus reducing induced drag.

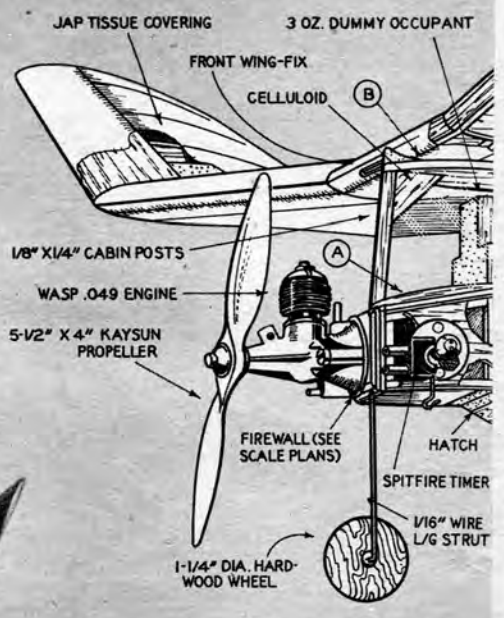
A Goettingen 602 airfoil section was selected because of its high lift-over-drag values and its excellent stall characteristics. To insure the maximum lift from the wing, its leading edge was planked.

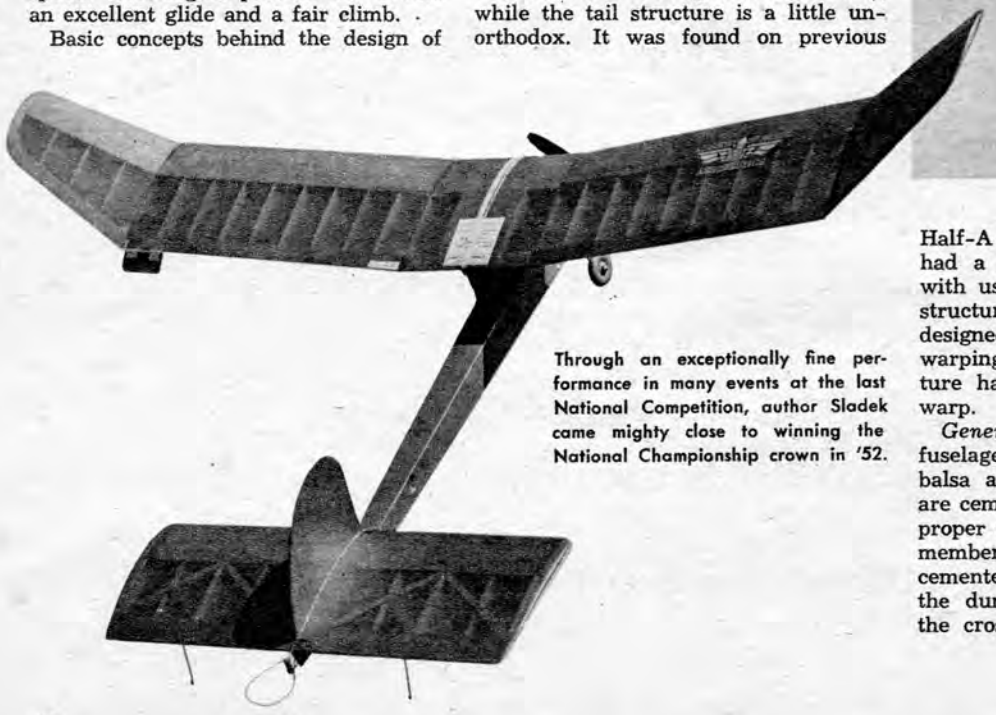
Fuselage cross sectional area and wetted area of the fuselage were kept to a minimum to get the lowest drag possible. A one-wheel landing gear was selected for the same reason.

This payloader was designed with a short tail moment arm. The short tail moment arm produced a small-diameter-glide circle which tends to keep it from drifting out of sight too fast.

The monocoque fuselage structure employed was found to be the most practical from the standpoint of strength, rigidity, and lightness. This type of structure is very easily fabricated, and can be built quite rapidly, due to the very few structural members required.

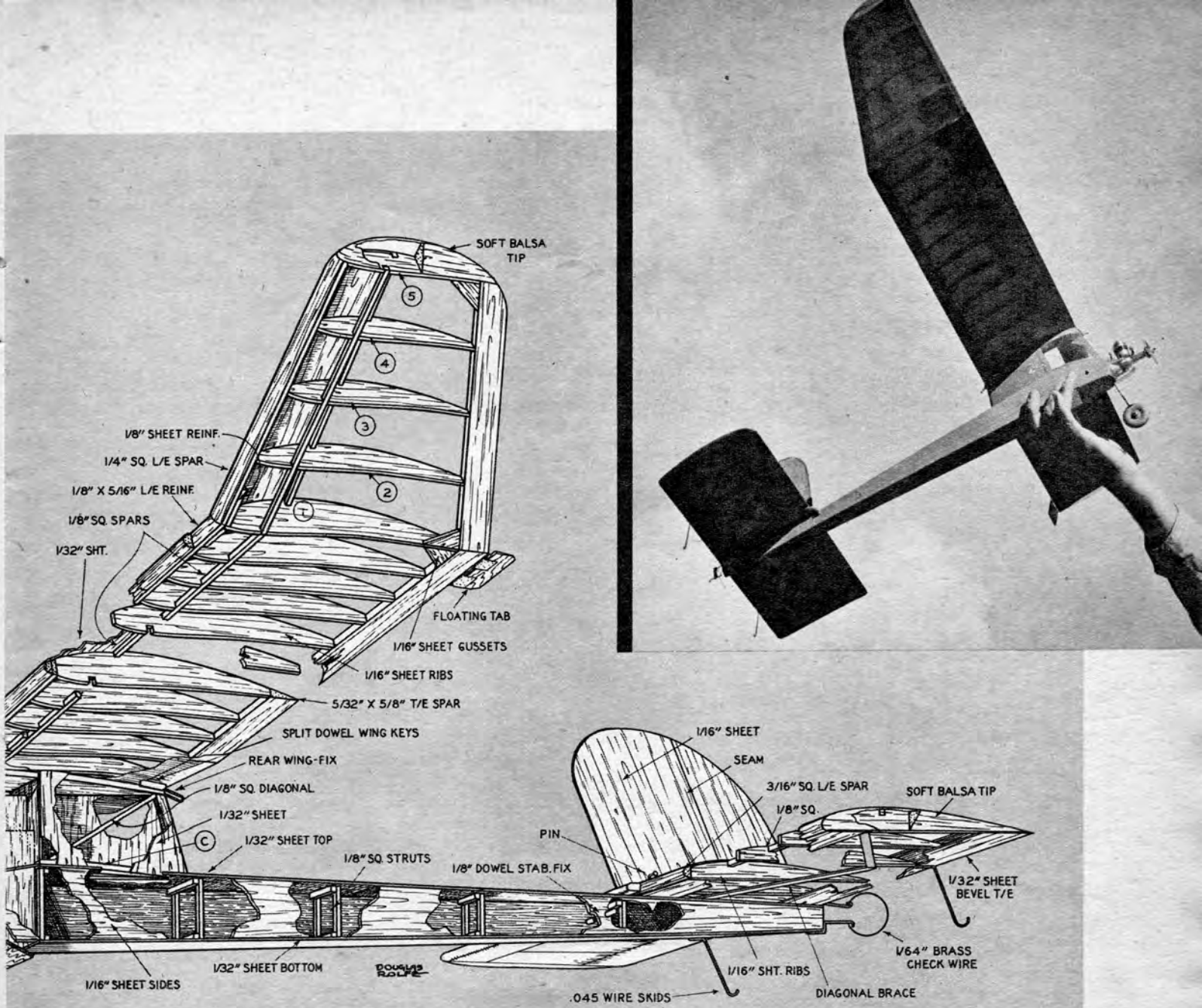
A conventional wing structure is used, while the tail structure is a little unorthodox. It was found on previous Half-A models that the horizontal tails had a great tendency to warp, even with use of plasticized dope. The tail structure for this model was specifically designed for great rigidity to prevent warping and twisting. So far this structure has not shown any tendency to warp.





Through an exceptionally fine performance in many events at the last National Competition, author Sladek came mighty close to winning the National Championship crown in '52.

General Construction Notes: The fuselage sides are cut from 1/16" sheet balsa and 1/8" square balsa uprights are cemented to the 1/16" sides at their proper stations. The 1/8" square cross members are cut to size and are first cemented to the straight section around the dummy's compartment. After all the cross members are cemented into



You can duplicate Sladek's "Pay Up"—the high-time model of the '52 Nats!

Dick's simplified construction and design refinements add up to a winner

place including the fire wall, the top and bottom of the fuselage is planked with 1/32" sheet. The cabin is built up last, planked with 1/32" sheet balsa.

The wing structure is conventional, but the horizontal tail construction is a little different. The 3/16" square leading edge is cemented to the flat side of one of the 1/32" x 1" sheets, forming the leading edge and lower camber planking. The lower portions of ribs are cemented to the 1/32" x 1" sheet leading and trailing edges. Then bevel the trailing edge; lastly add the 1/8" square spar. Next the upper surface planking is cemented into place and then all the cap strip ribs are glued in position. Finally, cement in tips.

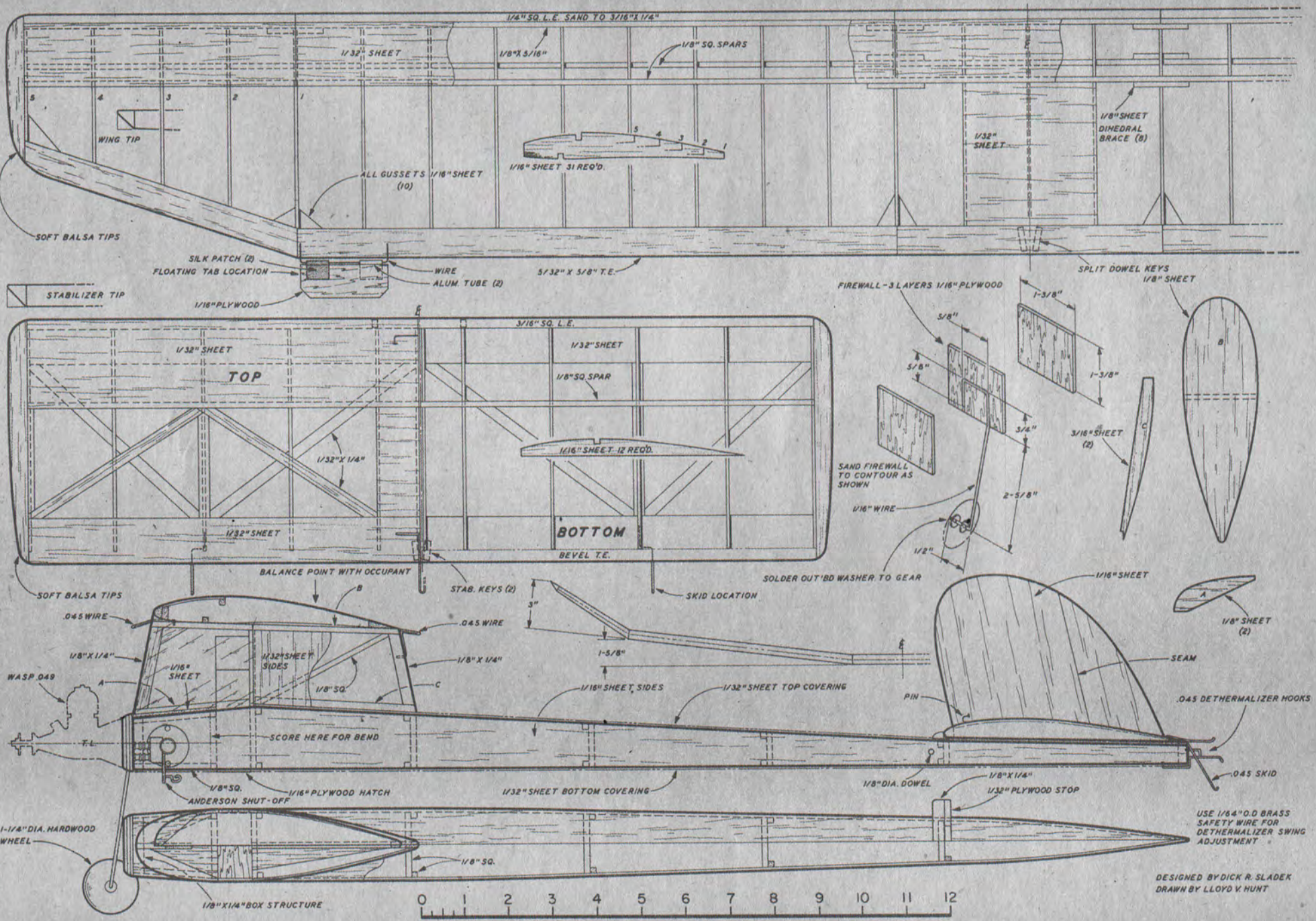
Be sure to leave a 1/16" slot in the horizontal tail for the vertical tail and use a light grade of balsa throughout.

Bill of Materials

3 pcs. 1/16" x 2" x 24" sheet balsa, fuselage sides. 2 pcs. 1/32" x 2" x 24" sheet balsa, fuselage top and bottom covering. 6 pcs. 1/8" x 1/8" x 36". 3 pcs. 1/32" x 2" x 36". 2 pcs. 1/16" x 3" x 36". 1 pc. 3/16" x 1/2" x 12". 1 pc. 1/8" x 1/4" x 12". 1 pc. 1/8" x 2" x 9". 1 pc. 3/8" x 1/2" x 24" soft balsa block. 1 pc. 1/16" plywood. 1 pc. .045" music wire. 1 pc. 1/16" o.d. music wire. 1 1 1/4" diam. hardwood wheel. 2 3/8" o.d. brass washers. 1 pc. of celluloid. 1 Spitfire timer. 1 plastic fuel line. 1 .049 Wasp. 1 5 1/2/4 Kaysun prop. 4 sheets Jap tissue. 1 pint clear dope. 1/2 pint fuel proofer. 1/2 pint colored dope. Cement.

Designer-author Dick Sladek is noted for his many outstanding contest models; wins often.

Build the model that flew longer officially than any other free flight at the Los Alamitos National Competition



DESIGNED BY DICK R. SLADEK
DRAWN BY LLOYD V. HUNT

Step up and meet...

. . . **Chester D. Lanzo** saw a 1927 twin pusher, had to try one himself. No records of how this first model turned out, but Chet has sure succeeded since. Has held 3 National outdoor stick and three cabin records. Twice a member of Wakefield Team. Started present R/C craze; his ship won first Nats R/C event in 1937—it was the only one that flew! In R/C events occasionally since, had R/C glider at Olathe Nats glider event—caused quite an uproar, though he didn't win. First builder to fly regular indoor microfilm job steered by radio! His Nats stick winner in 1937 had one of original dethermalizers. Daughter Sylvia is active contest flyer, wins events too. . . . **Warren E. Bartlett,** who directs the Plymouth International Meets at Detroit, has been modeling since 1932. Spare time hobby is building models (mostly railroads!) for individual sale. In Air Force 41 months as instrument flying instructor. Has private pilot license. First models were W.W.I. solids, then came Baby R.O.G.'s. Has tried most every sort of model, but leans toward Class A and B speed, though now deep in Team Racing. Still enters contests when models are in flyable condition. Very flattered with top handicap received several years ago at N. Y. Mirror Meet. Member of big plane clubs, Michigan Modeler's Assoc., Strathmoor Model Club, A.M.A. Bart's married, has one boy, three girls—all a bit young for modeling yet. . . . **Parnell Schoenky,** very active in rubber stick and cabin model flying, with plenty of contest places at Midwest meets to his credit, is remembered best for his activity with rotary and flapping wing aircraft. Has held National records in helicopter, autogiro and ornithopter; still holds Open record in latter two categories. Mechanical engineer with McDonnell Aircraft, spent 3½ years in Naval aviation. Started at 10 when Father brought home several Comet kits. Belongs to Kirkwood Thermaleers Club. Feels his best designs—many have been published—are "Flaphappy II" ornithopter, "Eggbeater II" heli., and 300 sq. in. cabin rubber job called "Big Boy." Not married. Has student flying permit. . . . **Howard L. Robinson,** co-owner of Shelby, Ohio, Pure Milk Co., married, two daughters who are a bit young yet for modeling. Spent two years in the Medical Corps. Started building planes back in 1928, first tackled the Baby R.O.G., then the Ideal Monocoupe. Howie won Open CO_2 event at 1949 Nats, among first ten placers in other Nationals. Took many places at meets in Ohio area. Active in Masonic work, also busy in Chamber of Commerce, American Legion. An AMA Contest Director and a director of Shelby Balsa Buzzards. Flies the big planes a bit. . . . **Harry D. McCall's** smiling face is a fixture at most large model meets. Runs Mac's Model Shop and Acme Model Distributors in Cleveland. Started in modeling in 1935 when he entered hobby business and felt he should know something about what he was selling. Active in the Academy, been a member since 1938; served as Veep of District 3 in 1950. Officer of American Airlines Gas Model Club, Cleveland Council of Model Aeronautics, old-timers' "8 Ball Club," and West Cleveland Kiwanis Club. (Bet those Kiwanians hear plenty about model aviation on their programs!) Married, helps other people's children with their modeling. . . . **Harry Copeland,** account executive with a concern dealing in stocks and bonds, married, daughter is wife of an Air Force Captain. Active in Civil Air Patrol since inception, Executive Officer of Syracuse Squadron. A director of Syracuse Model Airplane Club, which he organized under Exchange Club sponsorship in 1933. Runs N. Y. State contest each year for high school students. Has boosted modeling in Cub Scouts, YMCA, Salvation Army junior groups. Was instrumental in obtaining nation-wide Exchange Club sponsorship of model aviation. An AMA Fellow. When building, likes small gliders and scale jobs. Won medals in Scale at 1937 Nats. Ambition is to get model aviation instruction into industrial arts courses in schools throughout the nation. . . . **June Dyer** started building models in 1938, when son Jack became interested. Has been center of activity of practically every contest in Northern California. Runs a bakery with her husband and Jack. During war sent news sheet called the "Aeroneer" to every member of the East Bay Aeroneers Club in service. Has always favored free flight gas, particularly R.O.W., and has built and flown many F/F gassies. Also been active in towline and catapult gliders. June has received many honors for her efforts in behalf of modeling; received "appreciation trophy" from Northern Cal. F/F Council and the first K. & B. Certificate of Merit for her help to meets, organizations, and individuals. . . . **Don Foote** found old life raft in 1922—lots of balsa there, so he began making planes. Has always designed original models. Held records in Open R.O.W. and R.O.G. gas; latter in C was for a three-flight *average* time of over 24 minutes! Has big plane license. Been engaged in free-lance writing for last few years; two books devoted to modeling have recently been published: "Aerodynamics for Model Airplanes" and "Model Airplane Engines." Has been member of East Bay Aeroneers, was president for several years. Designed many widely copied F/F planes, some kitted such as "Westerner," "Foote Racer" and "Soarer." Married, has taught school, and conducted classes in building and flying of model planes.

C. Lanzo

W. Bartlett

P. Schoenky

H. Robinson

H. McCall

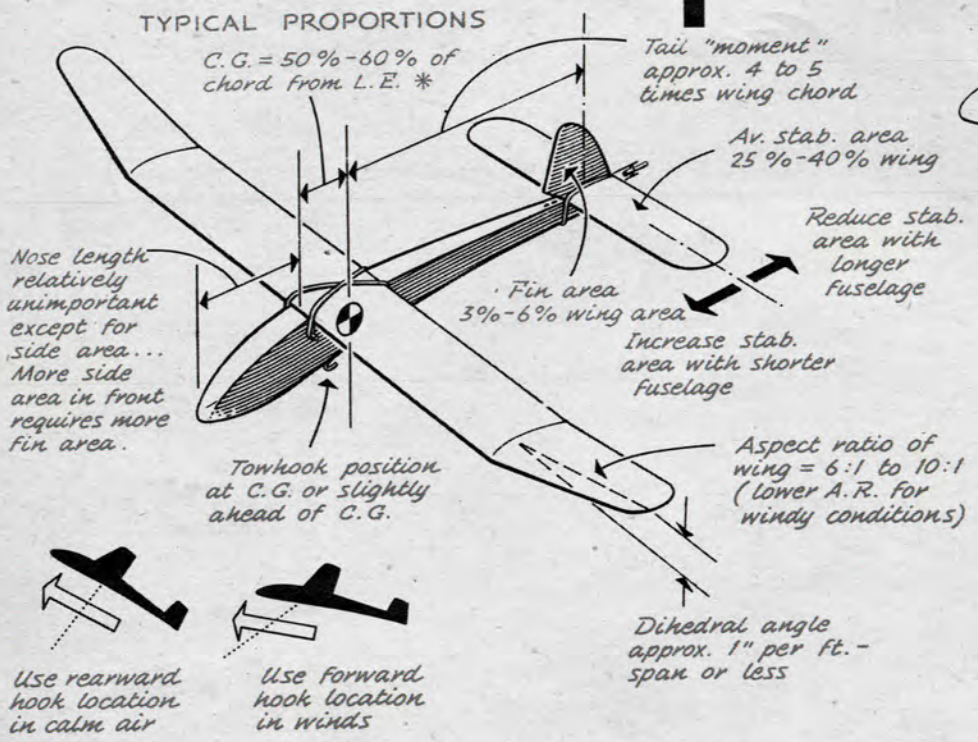
H. Copeland

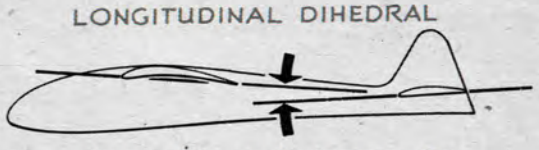
J. Dyer

D. Foote

AIR-MODEL MANUAL

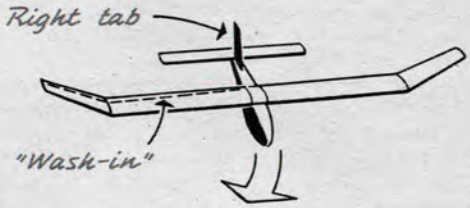
Towline models...


TYPICAL PROPORTIONS
C.G. = 50%-60% of chord from L.E. *
Tail "moment" approx. 4 to 5 times wing chord
Av. stab. area 25%-40% wing
Reduce stab. area with longer fuselage
Nose length relatively unimportant except for side area... More side area in front requires more fin area.
Fin area 3%-6% wing area
Increase stab. area with shorter fuselage
Towhook position at C.G. or slightly ahead of C.G.
Aspect ratio of wing = 6:1 to 10:1 (lower A.R. for windy conditions)
Dihedral angle approx. 1" per ft.-span or less
Use rearward hook location in calm air
Use forward hook location in winds

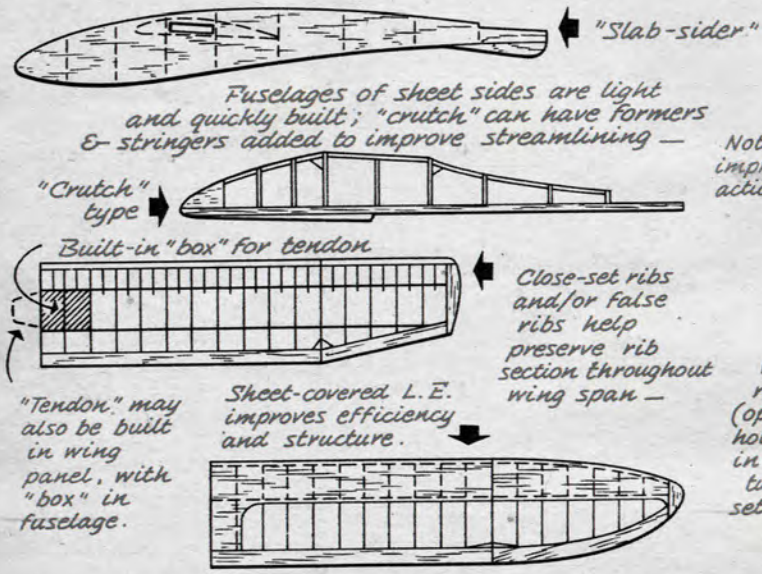


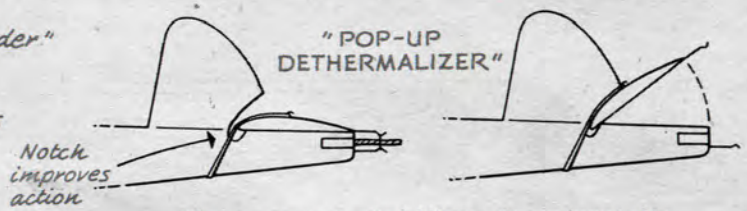
When this angle becomes too small, stall recovery can become critical, but using safest minimum cuts induced drag...

* C.G. must move forward as longitudinal dihedral increases; moves to greatest rearward location with minimum angle.

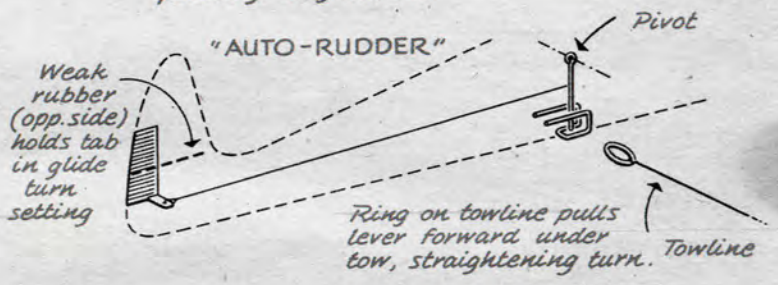


Flat, skidding turn is calm weather adjustment (near stall); windy or gusty weather calls for higher speed, more bank, a more forward C.G. location—


"Slab-sider"
Fuselages of sheet sides are light and quickly built; "crutch" can have formers & stringers added to improve streamlining—
"Crutch" type
Built-in "box" for tendon
Close-set ribs and/or false ribs help preserve rib section throughout wing span—
"Tendon" may also be built in wing panel, with "box" in fuselage.
Sheet-covered L.E. improves efficiency and structure.



The "pop-up" stabilizer is universally favored... Also in use are pop-out chutes, wing spoilers, pivoting wings, pivoting weights, etc.


"AUTO-RUDDER"
Pivot
Weak rubber (opp. side) holds tab in glide turn setting
Ring on towline pulls lever forward under tow, straightening turn.
Towline

Possibly no other category among model types affords the high caliber of performance for such a nominal outlay in time and effort as does the towline glider. It is not a difficult field for the novice to crack, and though it is highly recommended for beginners, there is latitude aplenty to attract the best efforts of expert builders and flyers.

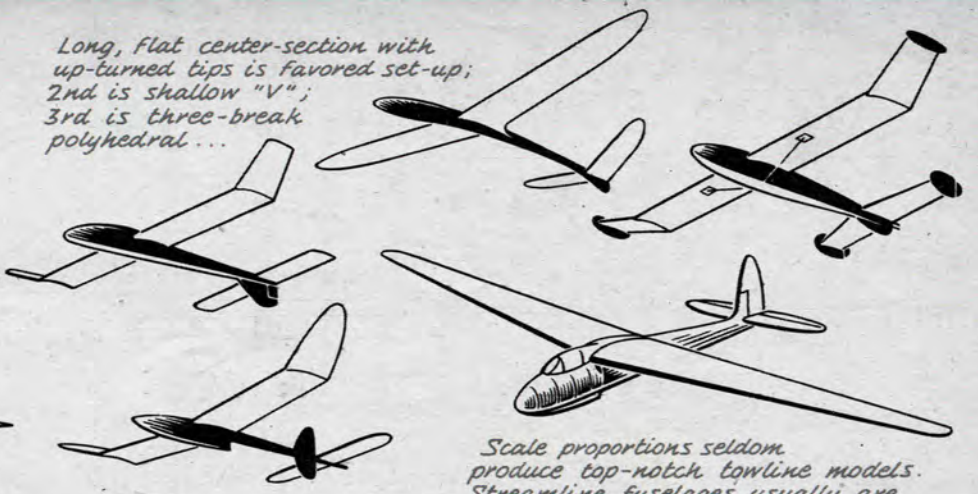
Abroad, towline flying is extremely popular and consequently has been developed to a high level. Some typical design differences between U. S. and foreign ideas are noted above. These spring primarily from basically different rules. Most popular towline type is built to F. A. I. Nordic A/2 rules (International) which involve craft spanning five to six feet with approximately 450 sq. in. wing area.

In this country, A. M. A. regulations now cover towliners in two size categories: "Limited" with maximum combined wing and stabilizer area of 350 sq. in. and Nordic A/2. Minimum weight in the "Limited" event is 10 ounces; like the Nordic it is flown on 328 ft. towline; there is no fuselage cross-section requirement.

Unusual types are popular abroad. Flying wings, canards, tandem wings, etc., are commonplace. Previous rules here favored flying wing types in that no cross-section requirements need be met and only two-thirds of total area counts. (Other one-third is considered stabilizing area.)

Up till now chief outward differences between U. S. and foreign designs have been in stabilizer areas and wing attachment methods.

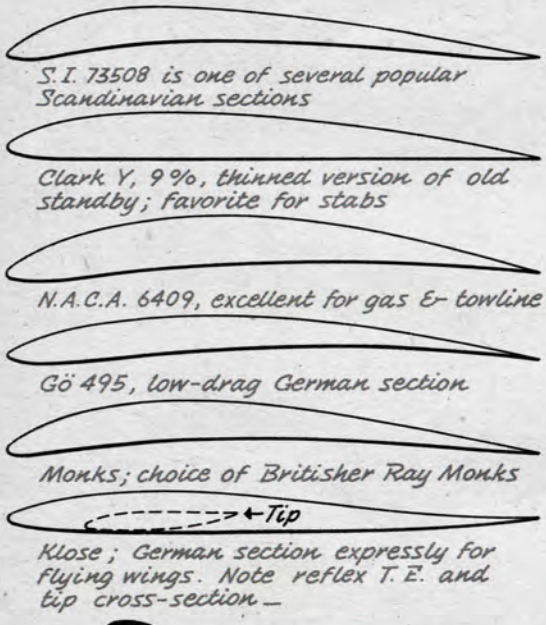
No greater satisfaction comes in modeling than through the flight of a graceful soaring glider. If you've never tried a towliner, now's the time to start



Long, flat center-section with up-turned tips is favored set-up; 2nd is shallow "V"; 3rd is three-break polyhedral . . .

Scale proportions seldom produce top-notch towline models. Streamline fuselages usually are heavier, more difficult to repair, & prove no more efficient than a well-built "slab-sider"—

WING PROFILES



S.I. 73508 is one of several popular Scandinavian sections

Clark Y, 9%, thinned version of old standby; favorite for stabs

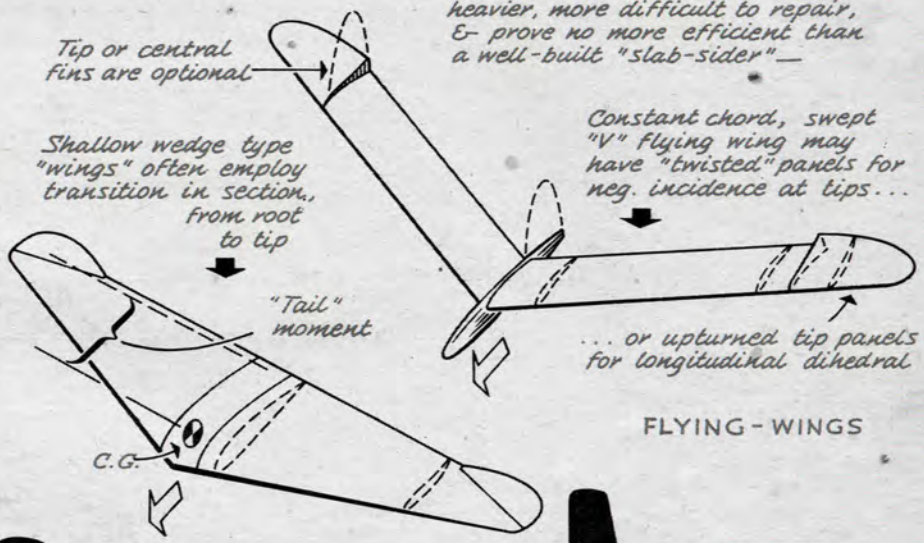
N.A.C.A. 6409, excellent for gas & towline

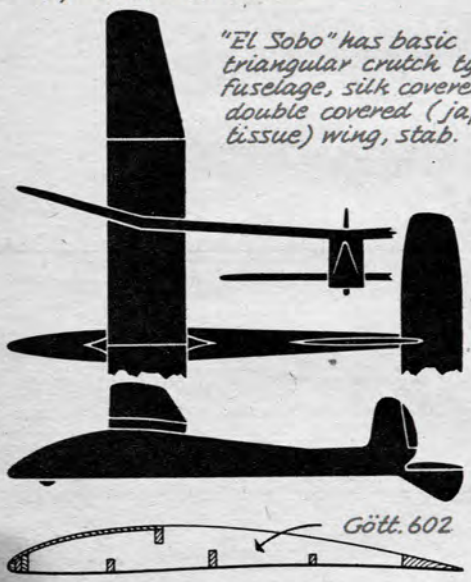
Gö 495, low-drag German section

Monks; choice of Britisher Ray Monks

Klose; German section expressly for flying wings. Note reflex T.E. and tip cross-section—

FLYING-WINGS

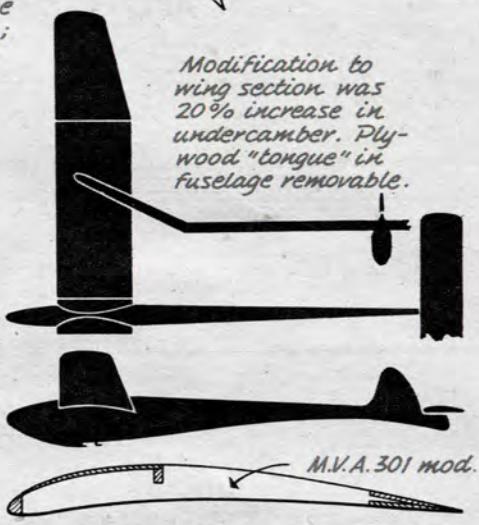

Tip or central fins are optional
Shallow wedge type "wings" often employ transition in section, from root to tip
"Tail" moment
C.G.
Constant chord, swept "V" flying wing may have "twisted" panels for neg. incidence at tips . . .
. . . or upturned tip panels for longitudinal dihedral



"El Sobo" has basic triangular crutch type fuselage, silk covered; double covered (jap tissue) wing, stab.

Götl. 602

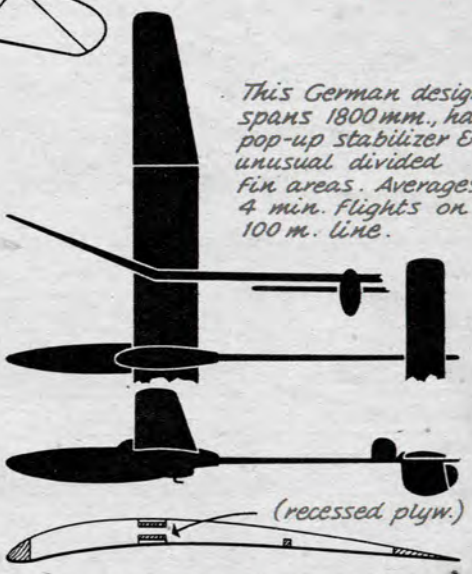
• *Everett's (U.S.) "El Sobo" is large, 90" span job, A.M.A. Cl. D; follows some European ideas. Placing towhooks near C.G. was important discovery—*



Modification to wing section was 20% increase in undercamber. Plywood "tongue" in fuselage removable.

M.V.A. 301 mod.

• *Gunic's (Yugoslavia) '52 Nordic winner of 68" span had short nose, plug-in wing panels. Totalled 14'-08" of a possible 15' to win international event—*



This German design spans 1800mm., has pop-up stabilizer & unusual divided fin areas. Averages 4 min. flights on 100 m. line.

(recessed plyw.)

• *Pegel's (Germany) A/2 Nordic of pod-and-boom type has undercamber at wing center, progressing to thin, flat-bottom section at wing tips—*

Nordic rules allow a *total* of 525 sq. in. area; designers allocate most of this to the wing, hence long fuselages and small stabs on foreign models as against the moderate fuselage lengths and typically American large stabilizers. In this country most wings are one-piece, being strapped to the fuselage by rubber bands; abroad the plug-in wing panels are favored. Both are felt to minimize damage in crashes.

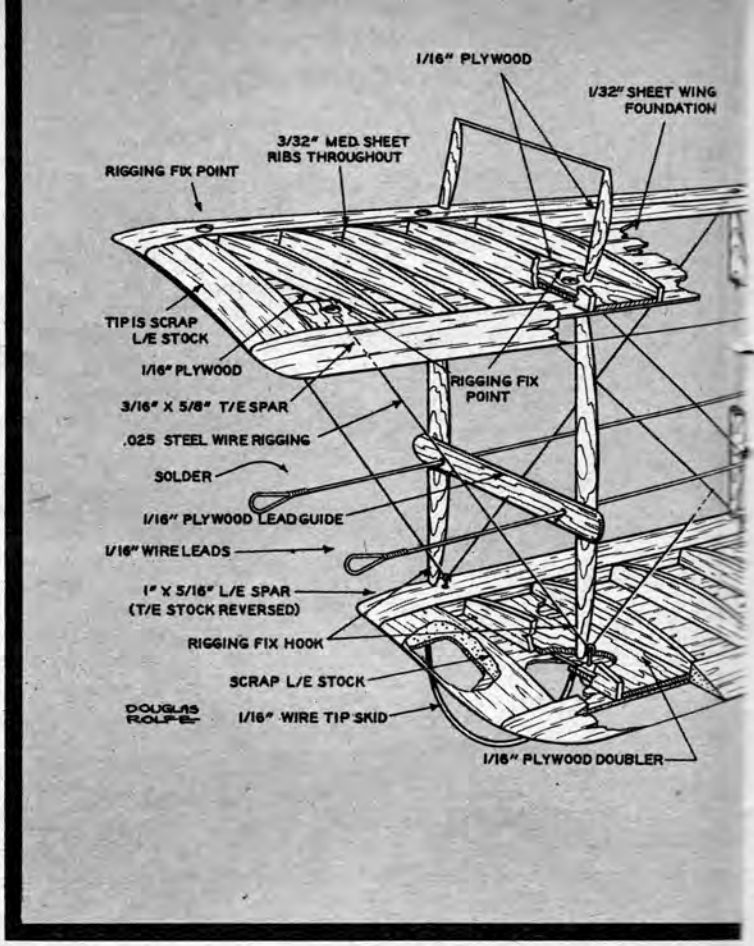
Just as a fast, climbing power flight largely determines the duration of a flight in gas jobs, so the high, straight tow makes or breaks the towliner's flight. Since medium to small glide turns are called for, the paramount problem is to straighten the flight path during the tow-up. Offset towhooks, an idea originating in the U. S., is perhaps the best solution. The hooks are simply mounted along one side of the belly, the same side to which the model normally turns. The resulting yaw offsets the usual turn while the model is being towed. Various mechanical "auto-rudders" are effectively used in which some means is employed to hold the tab against the turn during tow, neutralizing it as the towline drops free.

Designs often differ when meant expressly for calm or windy conditions. The higher aspect ratios fare best in calmer air, suffer most in gusty winds. Most popular dihedral arrangement is to sharply upturn tips at ends of a long, flat centersection panel. About one inch dihedral per foot span measured under each tip is adequate.

JENNY WAS A REAL LADY

The AT-6 of her time, Glenn Curtiss' bipe is a fitting subject as an old-time U/C'er

By DICK EALY

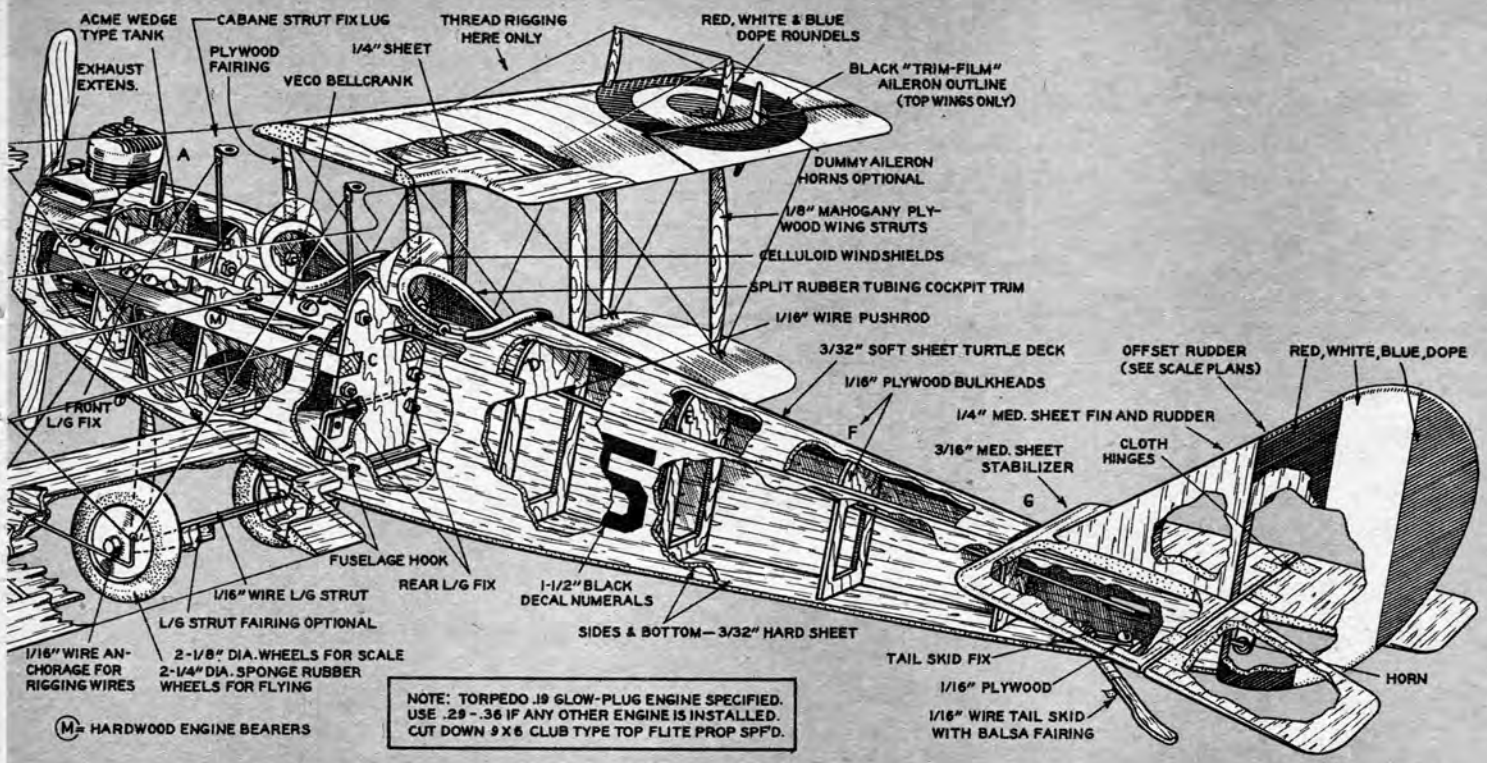


■ Queen of the skies may be the way many of us remember the Jennys that performed in the post W.W. I era. Barnstorming, aerial circuses, silent movie stunts saw Jenny in her glory, as daredevil men and women crawled out through the numerous bracing wires to wave at the crowd from the wingtip. Then the performance was topped off by hanging down from a wingtip skid or axle. Maybe our hero changed from a speeding car to the plane in motion, as an added thrill.

Jenny's story goes back before W.W. I, with Glenn Curtiss developing the JN-4 for Curtiss Flying Schools. Foreign countries bought them for their pilot instruction program, and when the U. S. entered the war the Curtiss plant along with seven others turned out 3,299 JN-4D's as our standard training ship using an OX-5 V-8 90 hp engine. It would climb to 2,000 feet in 10 minutes, and the maximum speed was 80 mph, with a 45 mph minimum. Advance trainer versions with 150 hp Hisso engines were used for gunnery, bombardment, and observation training. A total of 5975 Jennys were procured, and after the Armistice warehouses of uncrated new Jennys were auctioned at a fraction of their cost. That is the reason that hundreds of them appeared all over the U. S.

The model Jenny was built to a scale of 1" to 1' as a joint venture with the author as designer and Walt Farrell the builder and pilot. Our model has proved its airworthiness, having been flown nearly every Sunday over an eight-month period, or approximately 125 flights. With the powerful .19 Torpedo it takes off fairly fast and handles easily, going just where you want it. When the motor cuts, you can hear the whistling of the flying wires as it glides in for a realistic landing. Those wingtip skids come in handy on asphalt, as the wings rock due to narrow wheel tread.

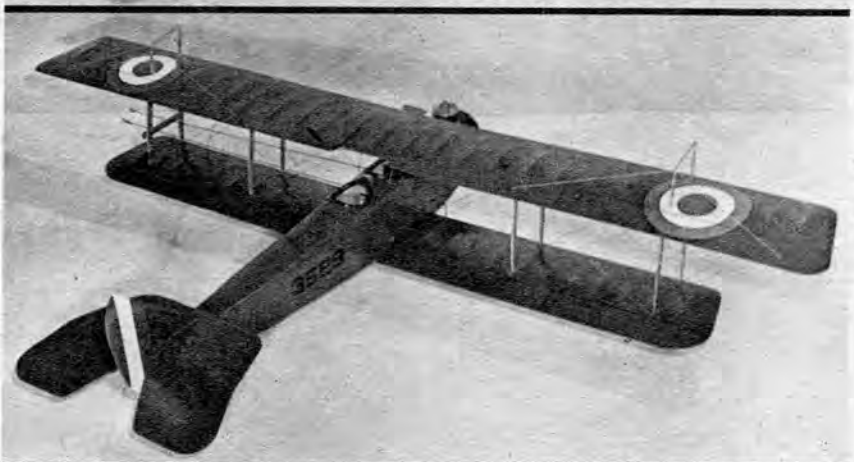
Bracing the long thin wings was the big problem. Since the fuselage, landing gear, and tail are conventional structure, we skip this and guide you through the wing construction. In fastening the landing gear, attach front strut to underside of motor beams with ¼" x ⅞" tin straps and 4-40 M.S. and nuts. Let rear strut dangle until lower wing is glued to fuselage. The way to build the wings is to cut 1/32" sheet balsa to outline of wing and rear edge to fit flush with trailing edge as shown in detail. Glue ribs on top of 1/32" sheet balsa wing bottom. The leading edge is a large 1" x 5/16" medium balsa trailing edge turned around with sharp edge forward. Glue this on top of 1/32" sheet balsa and add ribs and tips made from L.E. stock. Round L.E. with standing block. Bolt 1/16" wire tip skids under wing with 2-56 M.S.

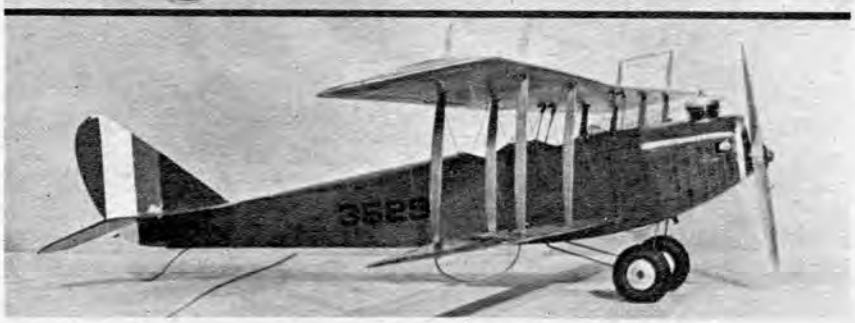

ACME WEDGE TYPE TANK
CABANE STRUT FIX LUG
PLYWOOD FAIRING
1/4" SHEET
THREAD RIGGING HERE ONLY
RED, WHITE & BLUE DOPE ROUNDELS
EXHAUST EXTENS.
VECO BELLCRANK
BLACK "TRIM-FILM" AILERON OUTLINE (TOP WINGS ONLY)
DUMMY AILERON HORNS OPTIONAL
1/8" MAHOGANY PLY-WOOD WING STRUTS
CELLULOID WINDSHIELDS
SPLIT RUBBER TUBING COCKPIT TRIM
1/16" WIRE PUSHROD
3/32" SOFT SHEET TURTLE DECK
OFFSET RUDDER (SEE SCALE PLANS)
RED, WHITE, BLUE, DOPE
1/16" PLYWOOD BULKHEADS
FRONT L/G FIX
1/4" MED. SHEET FIN AND RUDDER
3/16" MED. SHEET STABILIZER
CLOTH HINGES
FUSELAGE HOOK
REAR L/G FIX
1-1/2" BLACK DECAL NUMERALS
1/16" WIRE L/G STRUT
L/G STRUT FAIRING OPTIONAL
SIDES & BOTTOM—3/32" HARD SHEET
TAIL SKID FIX
1/16" WIRE ANCHORAGE FOR RIGGING WIRES
2-1/8" DIA. WHEELS FOR SCALE
2-1/4" DIA. SPONGE RUBBER WHEELS FOR FLYING
1/16" PLYWOOD
HORN
1/16" WIRE TAIL SKID WITH BALSA FAIRING
M= HARDWOOD ENGINE BEARERS
NOTE: TORPEDO .19 GLOW-PLUG ENGINE SPECIFIED. USE .29 - .36 IF ANY OTHER ENGINE IS INSTALLED. CUT DOWN 9 X 6 CLUB TYPE TOP FLITE PROP SPF'D.

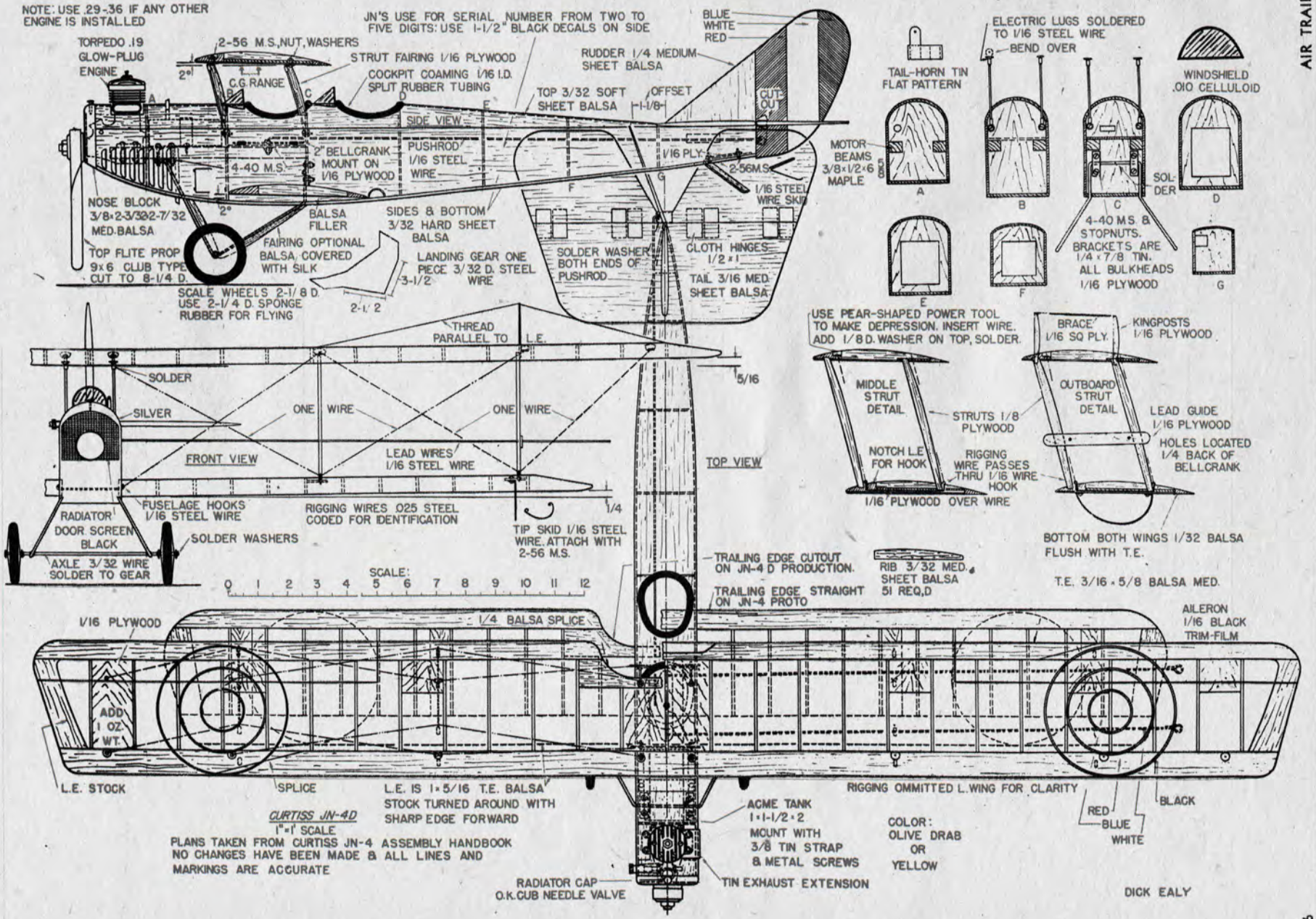
nuts and washers to protect the tips.

Note how 1/16" wire hooks are glued to top of 1/32" sheet bottom at strut positions on lower wings. Then reinforce by gluing 1/16" plywood plates over top wire. These plates must have holes made in them to receive struts. Steam in the dihedral 1 degree as shown. Cover lower wing with tissue. Spray with water to shrink. Brush on two coats of clear Testors dope. A hole is cut at center between two center ribs to allow access for attaching rear gear strut. Add wire fuselage hooks as shown in front view. Now glue wing in place and attach gear to bulkhead as shown. Cover fuselage bottom with 3/32" balsa. The fuselage, lower wing, and tail are now painted. Spray lacquer gray surfacer primer on after fuselage and tail have been covered with tissue. Sand with 400 paper. Spray Testors olive drab or yellow dope and follow with coat of fuelproof clear Sta Dope.

Now build upper wing in similar fashion. Add 1 oz. counterweight on right wingtip. Bottom of the wing only is primed and painted. Now make the depression on top of L.E. as shown for flying wires. Bolt wing to center struts with 2-56 M.S. and nuts and washers. Make eight identical ⅛" mahogony ply wing struts. Brush on 4 coats clear Sta. Install as shown in detail. Note how .025 steel wires are coded for identification. Lower ends pass through hooks and up through bottom of L.E. A washer is placed over wire end and soldered. Bend end of wire back for safety. Fill in holes of L.E. with plastic wood and sand smooth. Cover top of upper wing and paint as before. (*Further construction details on "AT" full-size plans.*)



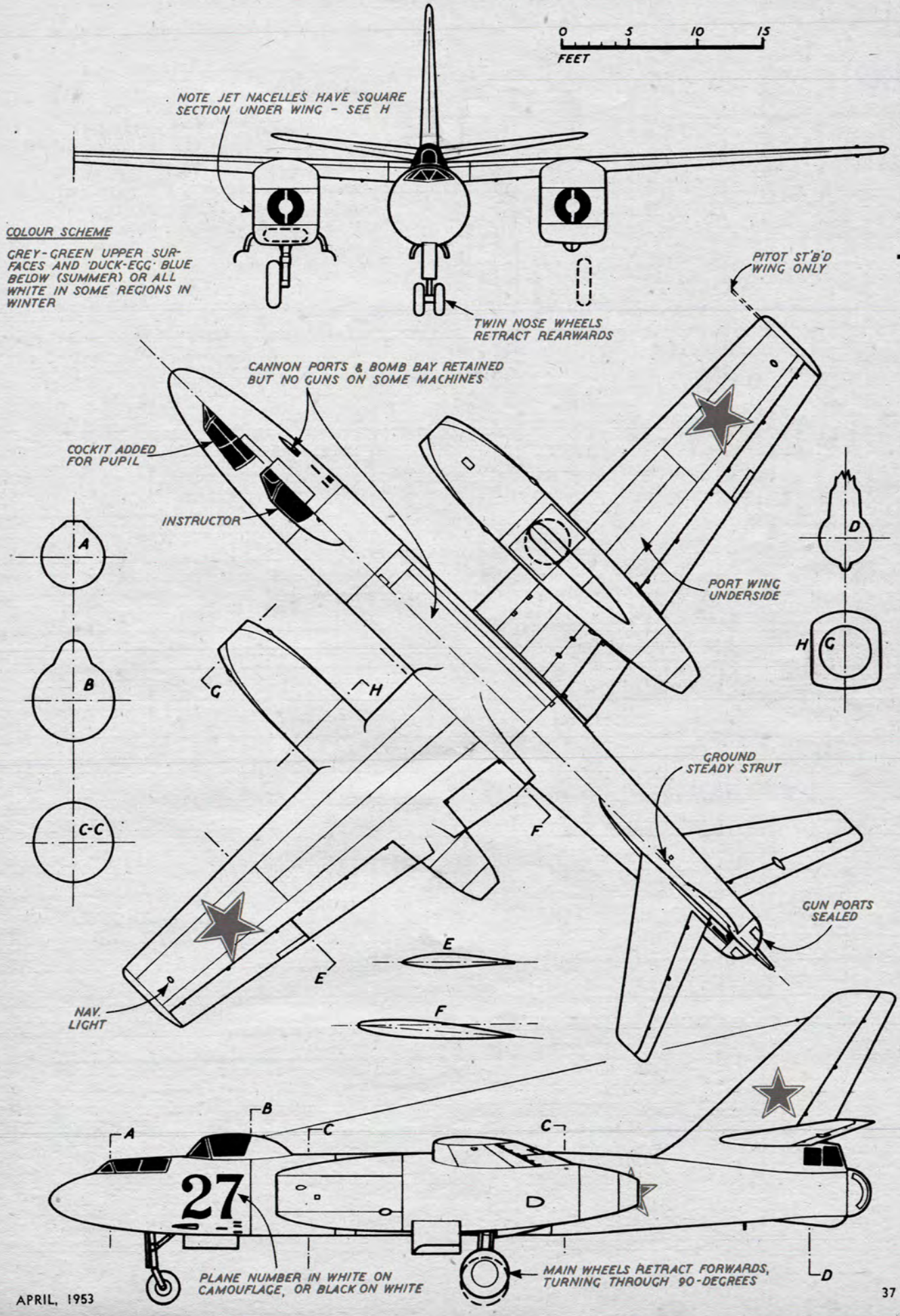



NOTE: USE .29-.36 IF ANY OTHER ENGINE IS INSTALLED
JN'S USE FOR SERIAL NUMBER FROM TWO TO FIVE DIGITS: USE 1-1/2" BLACK DECALS ON SIDE
BLUE
WHITE
RED
TORPEDO .19 GLOW-PLUG ENGINE
2-56 M.S.,NUT,WASHERS
STRUT FAIRING 1/16 PLYWOOD
COCKPIT COAMING 1/16 I.D. SPLIT RUBBER TUBING
C.G.RANGE
RUDDER 1/4 MEDIUM SHEET BALSA
TOP 3/32 SOFT SHEET BALSA
OFFSET
1-1/8
CUT OUT
SIDE VIEW
PUSHROD 1/16 STEEL WIRE
2" BELLCRANK MOUNT ON 1/16 PLYWOOD
4-40 M.S.
1/16 PLY
2-56M.S.
1/16 STEEL WIRE SKID
NOSE BLOCK 3/8x2-3/32-7/32 MED.BALSA
BALSA FILLER
SIDES & BOTTOM 3/32 HARD SHEET BALSA
TOP FLITE PROP 9x6 CLUB TYPE CUT TO 8-1/4 D.
FAIRING OPTIONAL BALSA COVERED WITH SILK
LANDING GEAR ONE PIECE 3/32 D. STEEL WIRE
3-1/2
SCALE WHEELS 2-1/8 D. USE 2-1/4 D. SPONGE RUBBER FOR FLYING
2-1/2
SOLDER WASHER BOTH ENDS OF PUSHROD
CLOTH HINGES 1/2 x 1
TAIL 3/16 MED. SHEET BALSA
MOTOR BEAMS 3/8x1/2x6 MAPLE
TAIL-HORN TIN FLAT PATTERN
ELECTRIC LUGS SOLDERED TO 1/16 STEEL WIRE
BEND OVER
WINDSHIELD .010 CELLULOID
SOL-DER
4-40 M.S. & STOPNUTS. BRACKETS ARE 1/4 x 7/8 TIN. ALL BULKHEADS 1/16 PLYWOOD
A
B
C
D
E
F
G
THREAD PARALLEL TO L.E.
5/16
SOLDER
SILVER
ONE WIRE
ONE WIRE
FRONT VIEW
LEAD WIRES 1/16 STEEL WIRE
TOP VIEW
RADIATOR DOOR SCREEN BLACK
FUSELAGE HOOKS 1/16 STEEL WIRE
RIGGING WIRES .025 STEEL CODED FOR IDENTIFICATION
1/4
SOLDER WASHERS
AXLE 3/32 WIRE SOLDER TO GEAR
TIP SKID 1/16 STEEL WIRE. ATTACH WITH 2-56 M.S.
USE PEAR-SHAPED POWER TOOL TO MAKE DEPRESSION. INSERT WIRE. ADD 1/8 D. WASHER ON TOP, SOLDER.
BRACE 1/16 SQ PLY.
KINGPOSTS 1/16 PLYWOOD
MIDDLE STRUT DETAIL
STRUTS 1/8 PLYWOOD
OUTBOARD STRUT DETAIL
LEAD GUIDE 1/16 PLYWOOD
HOLES LOCATED 1/4 BACK OF BELLCRANK
NOTCH L.E. FOR HOOK
RIGGING WIRE PASSES THRU 1/16 WIRE HOOK
1/16 PLYWOOD OVER WIRE
BOTTOM BOTH WINGS 1/32 BALSA FLUSH WITH T.E.
T.E. 3/16 x 5/8 BALSA MED.
SCALE:
0 1 2 3 4 5 6 7 8 9 10 11 12
TRAILING EDGE CUTOUT ON JN-4 D PRODUCTION.
TRAILING EDGE STRAIGHT ON JN-4 PROTO
RIB 3/32 MED. SHEET BALSA 51 REQ,D
1/16 PLYWOOD
1/4 BALSA SPLICE
AILERON 1/16 BLACK TRIM-FILM
ADD 1 OZ. WT.
L.E. STOCK
SPLICE
L.E. IS 1 x 5/16 T.E. BALSA STOCK TURNED AROUND WITH SHARP EDGE FORWARD
RIGGING OMMITTED L.WING FOR CLARITY
RED
BLUE
WHITE
BLACK
CURTISS JN-4D
1"=1' SCALE
PLANS TAKEN FROM CURTISS JN-4 ASSEMBLY HANDBOOK NO CHANGES HAVE BEEN MADE & ALL LINES AND MARKINGS ARE ACCURATE
ACME TANK 1-1-1/2-2 MOUNT WITH 3/8 TIN STRAP & METAL SCREWS
COLOR: OLIVE DRAB OR YELLOW
RADIATOR CAP O.K.CUB NEEDLE VALVE
TIN EXHAUST EXTENSION
DICK EALY

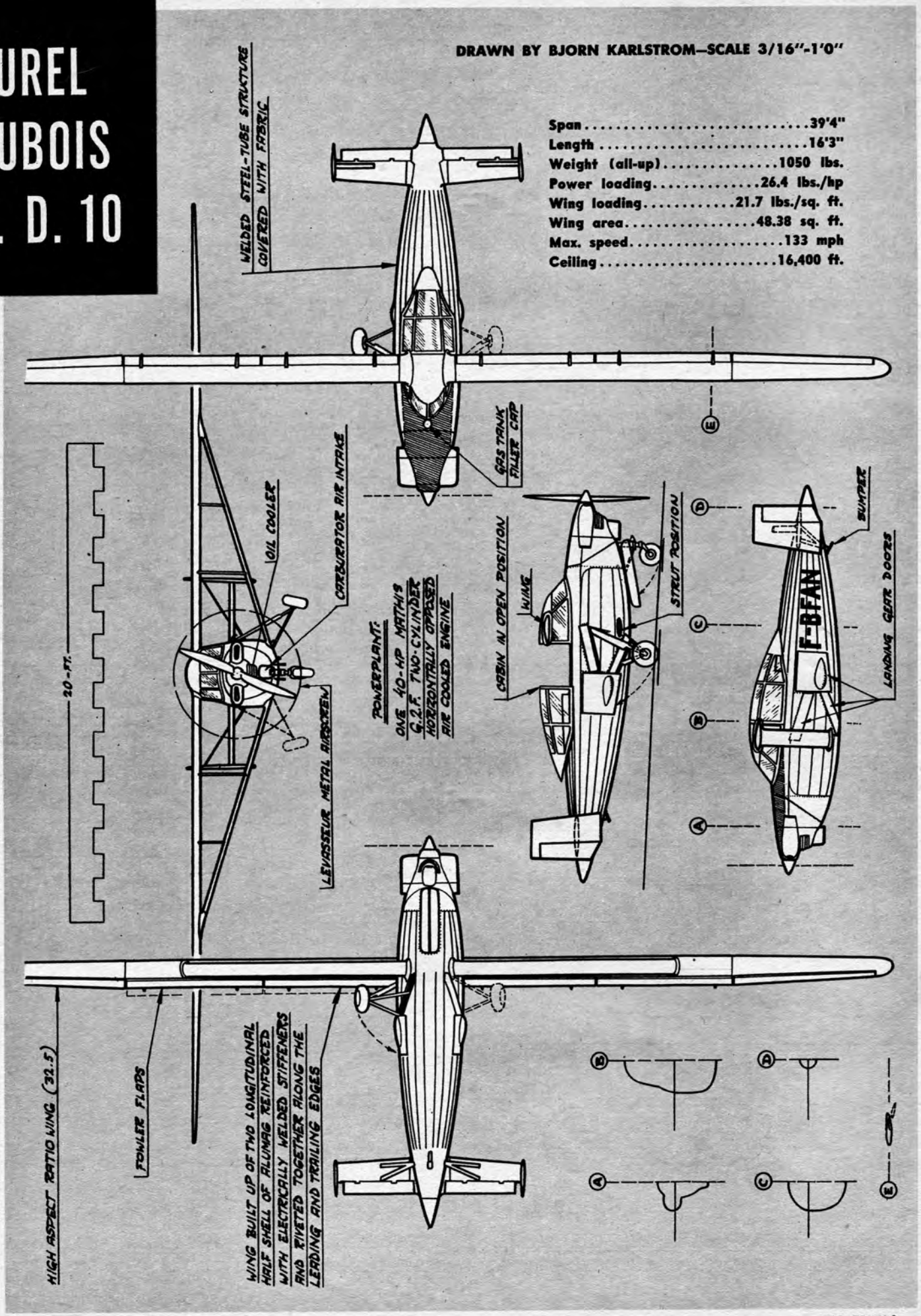
Even if you can't get started right away, you'll be smart to order a set of full size working drawings from Air Trails' Full Size Plan Department for this historic craft. The supply is limited!

Soviet Air Force U-IL-28

Advanced & Operational Trainer by ILYUSHIN

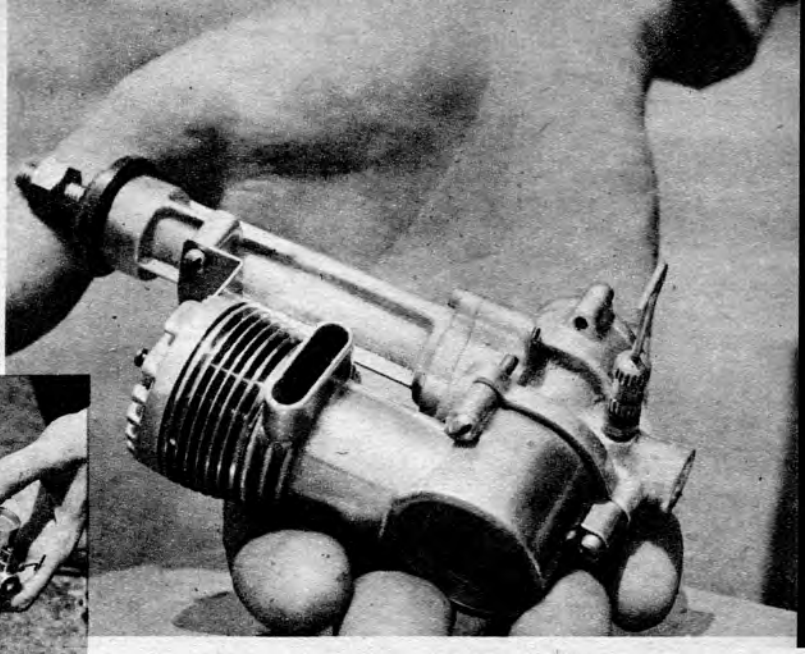


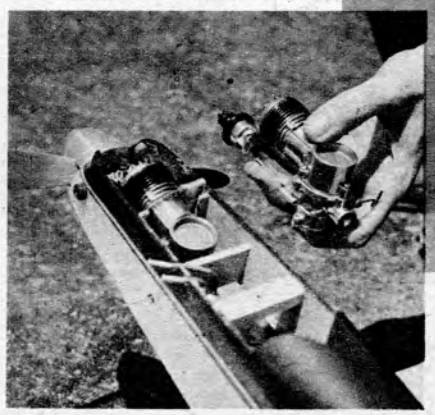
HUREL DUBOIS H. D. 10


DRAWN BY BJORN KARLSTROM—SCALE 3/16"-1'0"
Span.....39'4"
Length.....16'3"
Weight (all-up).....1050 lbs.
Power loading.....26.4 lbs./hp
Wing loading.....21.7 lbs./sq. ft.
Wing area.....48.38 sq. ft.
Max. speed.....133 mph
Ceiling.....16,400 ft.
WELDED STEEL-TUBE STRUCTURE COVERED WITH FABRIC
GAS TANK FILLER CAP
OIL COOLER
CARBURETOR AIR INTAKE
LEVASSEUR METAL AIRSCREW
POWERPLANT: ONE 40-HP MATHIS G.2.F. TWO-CYLINDER HORIZONTALLY OPPOSED AIR COOLED ENGINE
CABIN IN OPEN POSITION
WING
STRUT POSITION
SUNTRAP
LANDING GEAR DOORS
F-BFAN
20-FT.
HIGH ASPECT RATIO WING (32.5)
FOWLER FLAPS
WING BUILT UP OF TWO LONGITUDINAL HALF SHELL OF PLYWOOD REINFORCED WITH ELECTRICALLY WELDED STIFFENERS AND RIVETED TOGETHER ALONG THE LEADING AND TRAILING EDGES

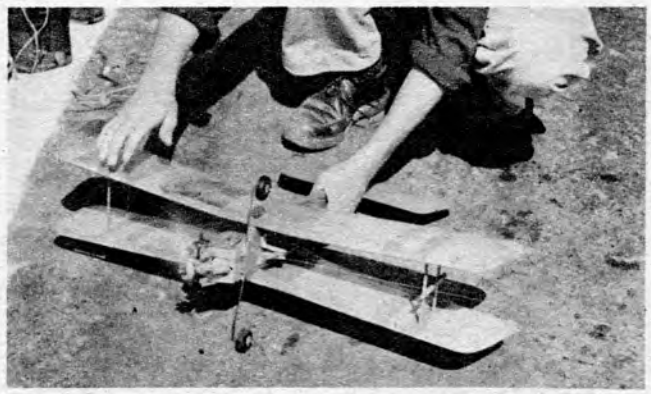
Stunt Snaps

Cal Smith's camera caught these beauties at the Los Alamitos stunt competition. Neat, what?

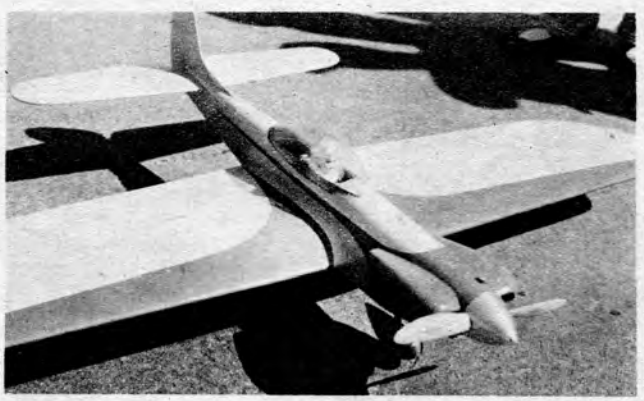




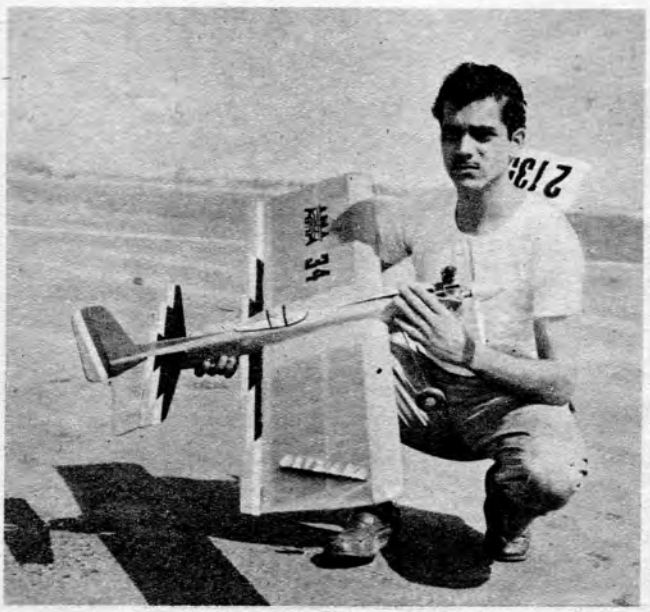
Folded flat engine by Clarence F. Lee of Tujunga, Cal.; as .32 cu. in. experimental job with Veco case and head. Shaft and gear housing of aluminum; Boston gears, 9.5 oz., 11,000 rpm on 10/6, ball bearings.



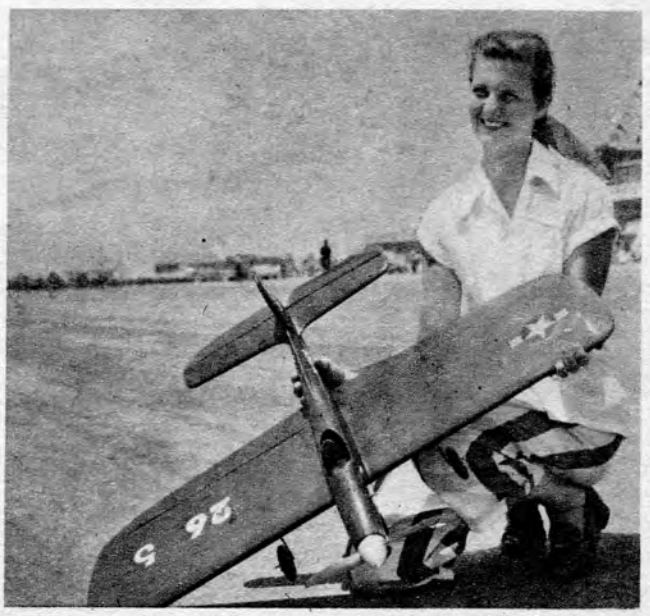
Bob Swenson, Orange, Calif., had trick biplane, "Gollywalk." Outthrust of 25 deg. enables tail stands. K&B .19, Dihedral & cathedral.



Another shot of Lou Andrews' stunt job, one of cleanest models in competition. Lou swung over to tricycle gear to get max. landing pts.



Elias Chain of Mexican team with beautifully finished stunter powered by Fox .29. Coloring, covering typical of fine Mexican jobs.



Sweet pair! Janyce Wood, 17, Pittsburgh, Calif., with original which had Fox .35, 9/6 Tornado prop. O&R #2 fuel. Striped pants, too.

National Speed Picture

Flashbacks to the colorful Los Alamitos competitions

Erick Moline (left) of Oakland, Calif., flew this inverted engine Cl. D speedster at last Nats. Ship handled well, completed all flights, has done 140 plus so far. Note simple lines on dolly.

Violet and M. G. Hoyt (below) of San Diego. Violet won Women's High Point Championship as well as open jet event in which she did 144 plus, and M. G. fourth. This Cl. C entry of hers did 120.

Sgt. Mark Brown, USAF, (left) is the remarkable young chap who copped three "firsts" in senior speed flying: Class C with 125.17 mph; Cl. A at 117.18 mph.; and Cl. B with 130.15 mph. In Cl. D he did not do well—only 2nd with 140.84!

"Champion in Repose" (above) fits George Mueller's Class A speed model of 131.77 mph first-place fame. Design will be presented in a coming Air Trails.

Frank Stone (left) of Dallas fills balloon tank of Class B which took open honors with 131.77 mph—exactly same speed as Mueller! McCoy .29, original design.

Speed Bug—

You gotta get around that pylon a lot faster now that the A/2 jobs are "official"

■ By doing a bit of cutting and filing on the Space Bug engine, it is possible to produce a speed model in the Half-A class that will compare in appearance with the larger speed jobs.

There is nothing startling about the *Speed Bug* with respect to basic speed layout. It represents what can be done in the A/2 speed class when all the latest items are used.

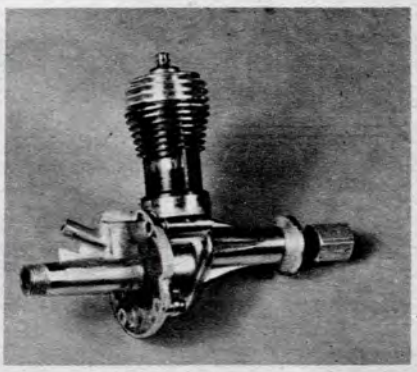
When speed is the objective, the model should be kept light, but still strong enough to hold up under the high-speed conditions. By using those grades of balsa specified, the model's weight will be held to a reasonable figure, providing you do not overload it with the "paint" job.

The Space Bug was used on the original model. However, other engines are quite suitable. For example, by moving the firewall ⅛" forward, the Wasp can be used.

If you choose the Space Bug it is necessary to cut off the tank at the point shown on the drawings. Also, cut away the web that joins the fuel line with the air intake tube so that regular fuel tubing can be used to connect the balloon tank to the engine as shown. It is also recommended that the reed valve be removed from the engine before the above cutting and filing is done. After the job is finished, rinse the engine in gas to remove filings. Be careful to test-run the engine after the reed is replaced to make sure it works properly.

It is also a very good idea to acquaint yourself with the engine's characteristics before installing it in the model.

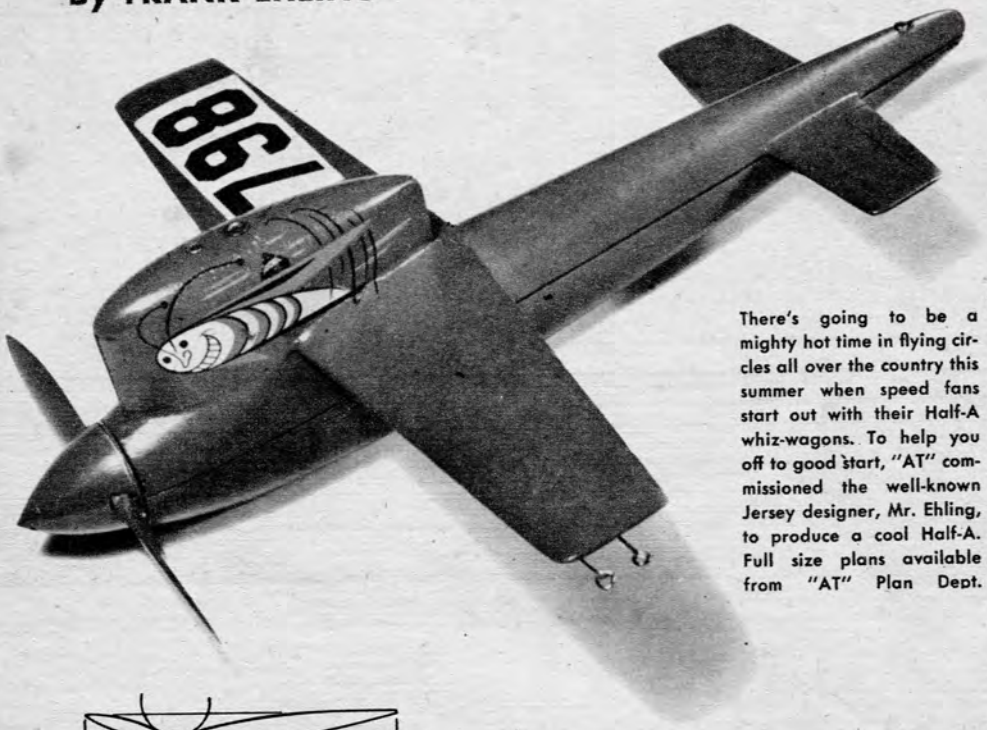
Start building the model by carving and shaping (*Continued on page* 68)



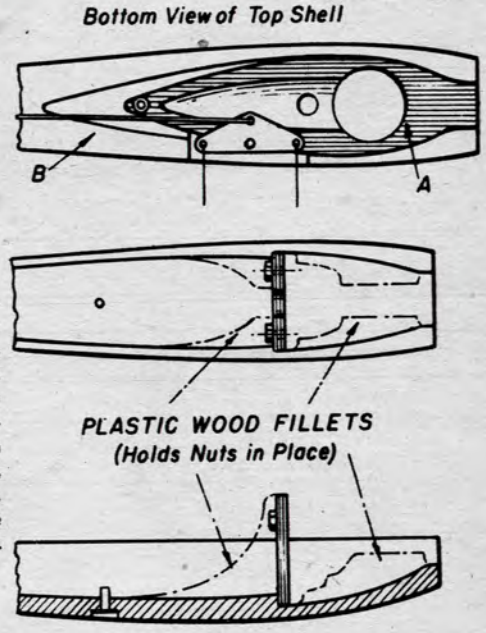
Stripped of its tank, the new Cox powerplant is a mighty small handful of high-powered dynamite.

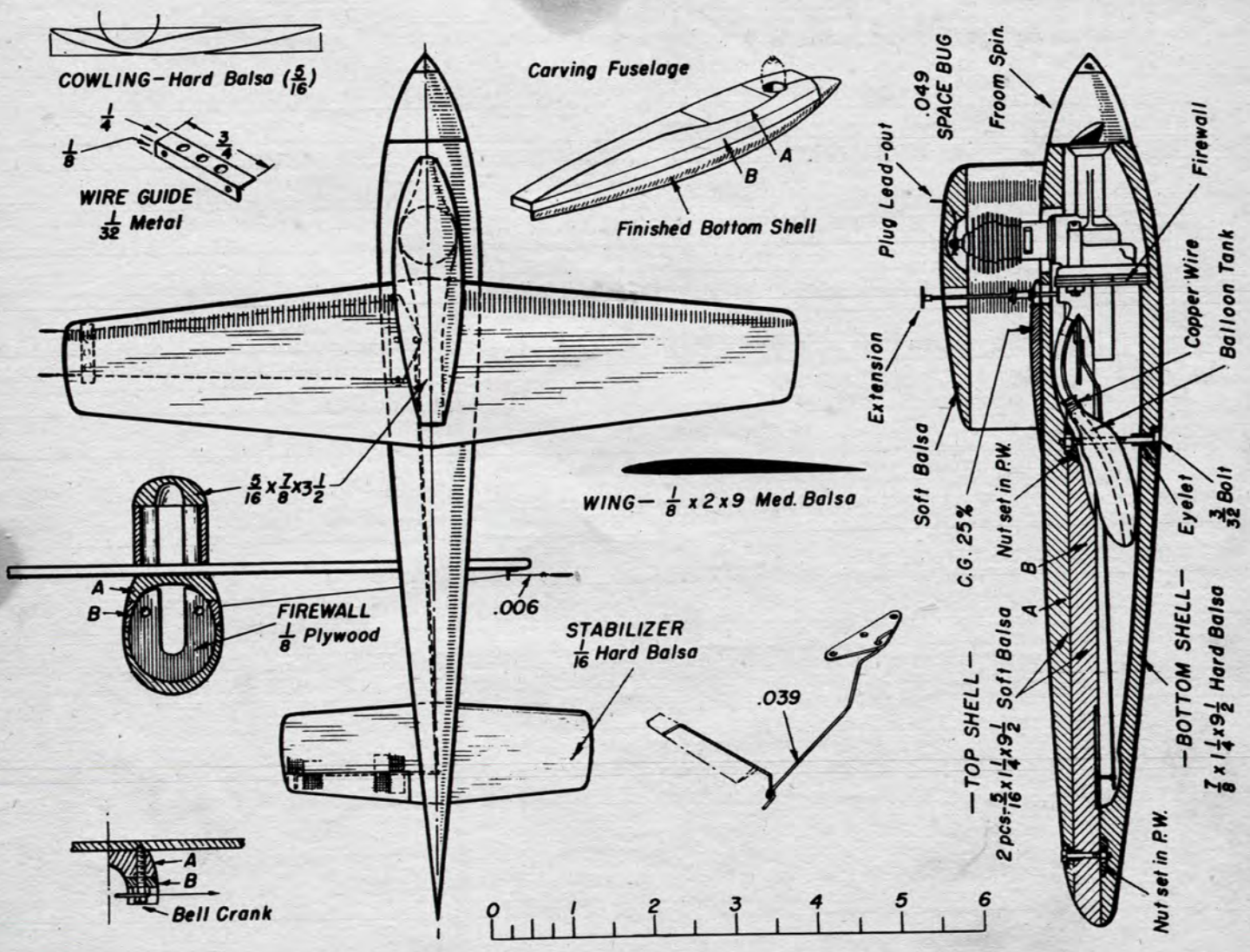
—FOR THE NEW A. M. A. HALF-A SPEED EVENT

By FRANK EHLING



There's going to be a mighty hot time in flying circles all over the country this summer when speed fans start out with their Half-A whiz-wagons. To help you off to good start, "AT" commissioned the well-known Jersey designer, Mr. Ehling, to produce a cool Half-A. Full size plans available from "AT" Plan Dept.





TESTORS

"39"

MODEL ENGINE FUEL

By every standard of comparison — easy starting, all-weather performance, power output, quality and quantity of lubrication – Testors "39" is the outstanding all-purpose fuel for both Glo and Ignition type of standard model engines. It was developed after many months of research; flight-tested and approved by experienced modelers under the most extreme conditions of stunt, contest, and just-for-fun flying. Try Testors "39" now. See for yourself what top *power*formance really means!

● Half-Pint.....39c; Pint.....75c; Quart.....$1.40

for modelers

TOP POWER*formance*

. . . FOR STUNT, CONTEST, OR JUST-FOR-FUN FLYING

TESTORS BRANDED BALSA

TESTOR CHEMICAL CO

s who want the best!

TESTORS DOPE

STA HOT FUEL PROOF FINISH

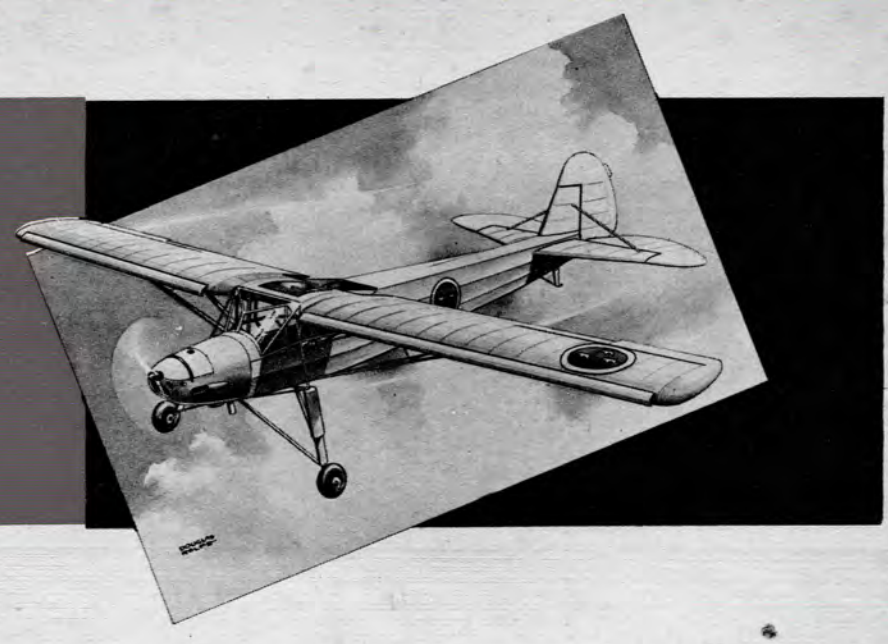
INSIST ON THESE OTHER TESTORS MODEL SUPPLIES TOO . . . *by name!*

TESTORS MODEL AIRPLANE CEMENTS

COMPANY • ROCKFORD, ILLINOIS

Fieseler Storch Fi 156

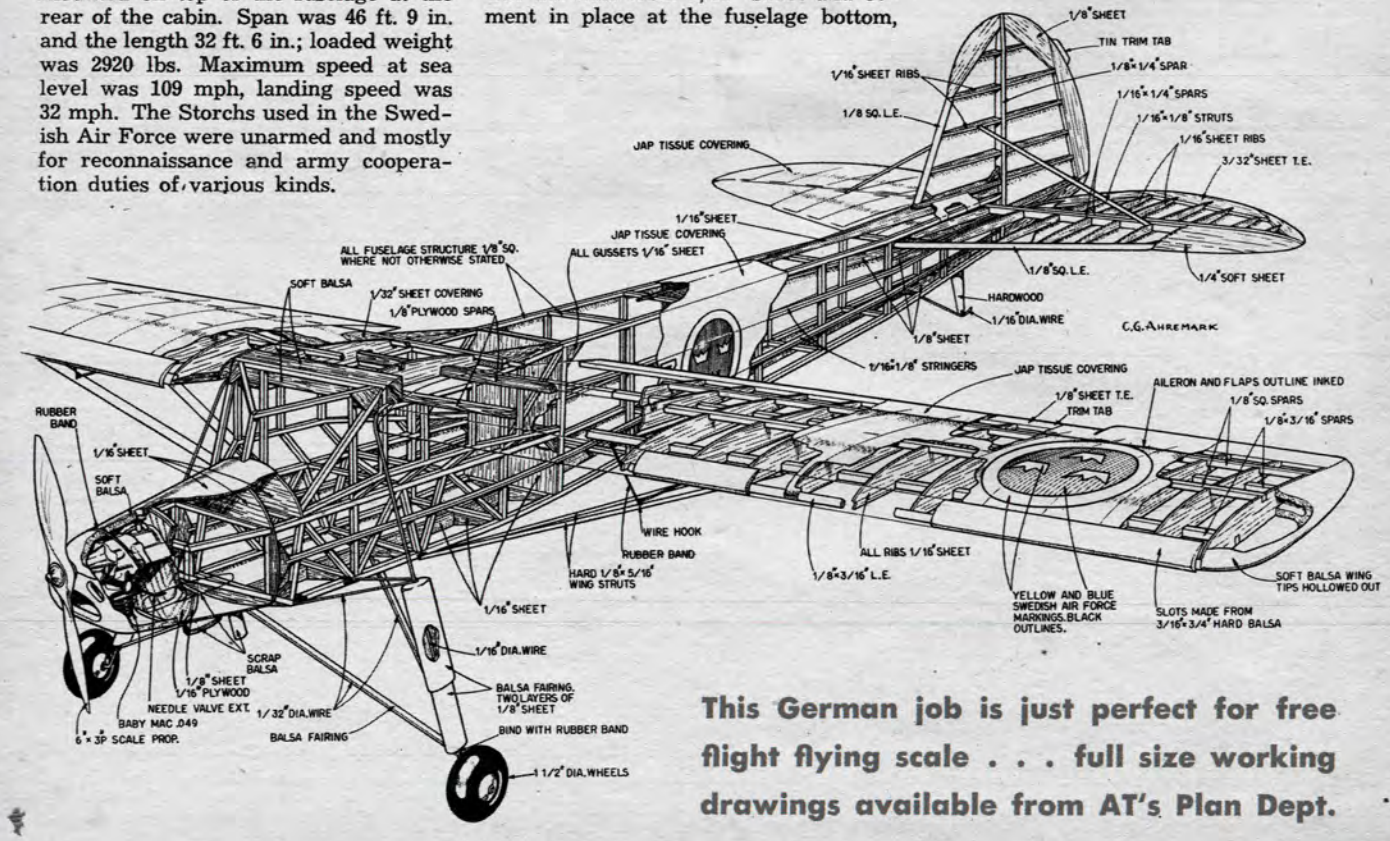
By CARL G. AHREMARK



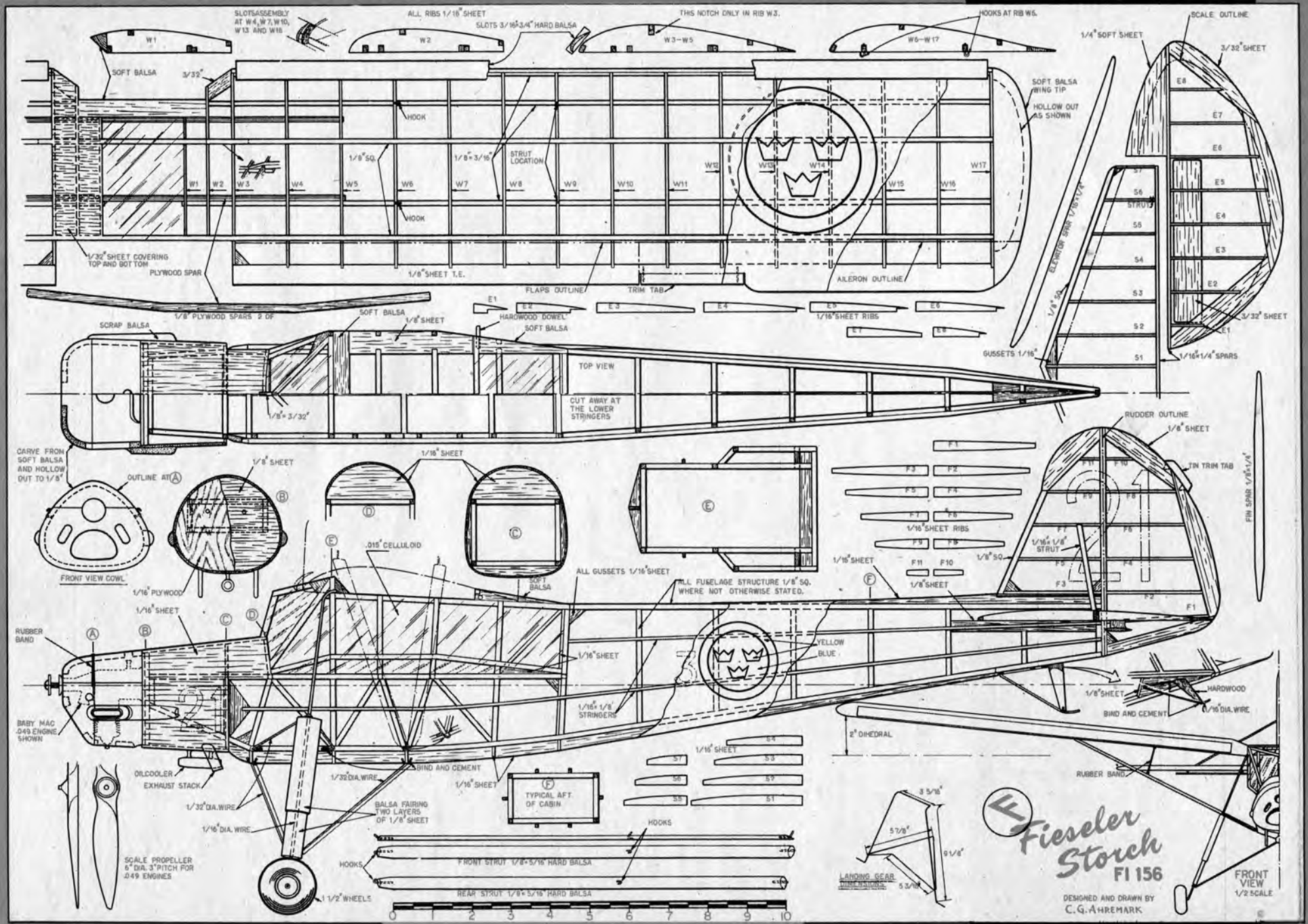
■ The Fieseler Fi 156 "Storch" was developed before the war by the Gerhard Fieseler Werke S.M.B.H. of Kassel, Germany. It was designed specifically for slow-speed flight and for take-off from and landing in restricted areas. The Fi 156 was exclusively used throughout the war on various duties, as a staff transport plane, for short-range reconnaissance and army cooperation, and as an ambulance.

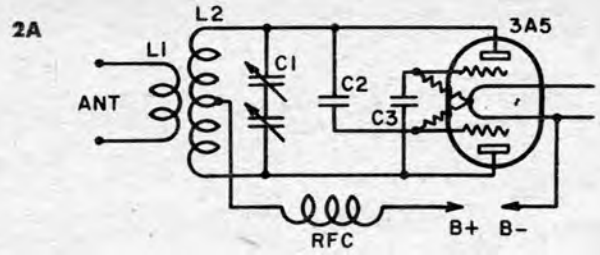
It had a welded steel tube fuselage and wing and tail unit of wooden construction. The landing gear was the split type with long-stroke shock absorbers. The powerplant was one 240 hp Argus AS 10C inverted V-8. Some models had a single machine gun mounted on top of the fuselage at the rear of the cabin. Span was 46 ft. 9 in. and the length 32 ft. 6 in.; loaded weight was 2920 lbs. Maximum speed at sea level was 109 mph, landing speed was 32 mph. The Storchs used in the Swedish Air Force were unarmed and mostly for reconnaissance and army cooperation duties of various kinds.

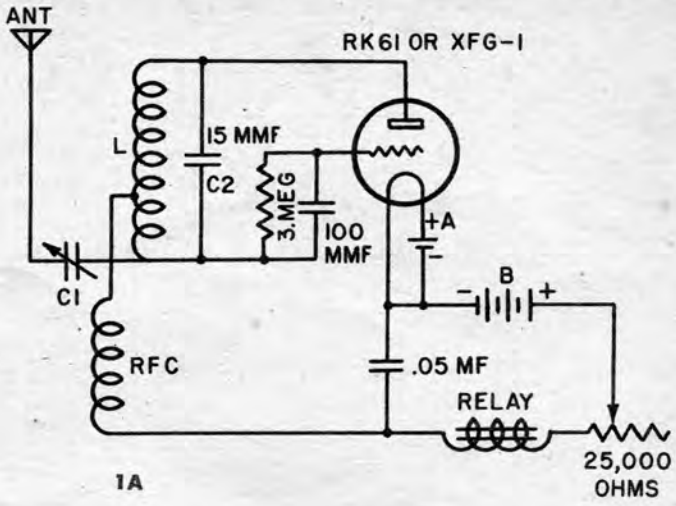
This model is of the "English School," fairly heavy and possibly a trifle underpowered, but it gives very steady and scale-like flying with an .049. Before you start the building, trace and reverse the fuselage sides, wing and stabilizer halves. Begin construction by making two fuselage sides of 1/8" sq. hard balsa, one on the plan, the other on the tracing. When the sides have dried thoroughly, remove them from the plans and add all cross-pieces starting at the cabin. Cut out all formers and glue former (B) together from balsa and plywood. Cement the formers and the 1/16" sheet at the rear of cabin to the fuselage at their proper places. Cement the stringers on the fuselage sides. Cut the keel from 1/16" sheet and cement in place at the fuselage bottom, then fill out with triangular pieces as shown at (E). Solder the engine mounting nuts to a strip of brass, then cement or sew to the rear side of (B). Cover the nose section with strips of 1/16" sheet. Cement the windshield frames and their gussets in place. Assemble the tailskid and cement in place, using the cement liberally. Cement the strip of 1/16" sheet in place on the top of the rear end of fuselage. Build up the cowl from soft balsa, carve, then glue the bottom half to (B). Bend the landing gear to shape from 1/16" wire and cement in place with the triangular-shaped wing rest at top of (E). *(More details on "AT" full-size plans.)*



This German job is just perfect for free flight flying scale . . . full size working drawings available from AT's Plan Dept.


SLOTS ASSEMBLY AT W4, W7, W10, W13 AND W16
ALL RIBS 1/16" SHEET
SLOTS 3/16"x3/4" HARD BALSA
THIS NOTCH ONLY IN RIB W3.
HOOKS AT RIB W6.
SOFT BALSA
3/32"
HOOK
1/8" SQ.
1/8"x3/16"
STRUT LOCATION
SOFT BALSA WING TIP
HOLLOW OUT AS SHOWN
1/32" SHEET COVERING TOP AND BOTTOM
PLYWOOD SPAR
1/8" SHEET T.E.
FLAPS OUTLINE
TRIM TAB
AILERON OUTLINE
1/8" PLYWOOD SPARS 2 OF
1/16" SHEET RIBS
SCALE OUTLINE
1/4" SOFT SHEET
3/32" SHEET
ELEVATOR SPAR 1/8"x1/4"
STRUT
GUSSETS 1/16"
1/16"x1/4" SPARS
SCRAP BALSA
SOFT BALSA
1/8" SHEET
HARDWOOD DOWEL
TOP VIEW
CUT AWAY AT THE LOWER STRINGERS
1/8"x3/32"
RUDDER OUTLINE
1/8" SHEET
TIN TRIM TAB
FIN SPAR 1/8"x1/4"
CARVE FROM SOFT BALSA AND HOLLOW OUT TO 1/8"
OUTLINE AT Ⓐ
FRONT VIEW COWL
1/16" PLYWOOD
1/16" SHEET
.015" CELLULOID
SOFT BALSA
ALL GUSSETS 1/16" SHEET
ALL FUSELAGE STRUCTURE 1/8" SQ. WHERE NOT OTHERWISE STATED.
1/16" SHEET
1/8" SHEET
1/16"x1/8" STRUT
1/8" SQ.
RUBBER BAND
YELLOW
BLUE
1/16"x1/8" STRINGERS
HARDWOOD
1/16" DIA. WIRE
BIND AND CEMENT
2° DIHEDRAL
RUBBER BAND
BABY MAC .049 ENGINE SHOWN
OILCOOLER
EXHAUST STACK
1/32" DIA. WIRE
1/16" DIA. WIRE
BALSA FAIRING TWO LAYERS OF 1/8" SHEET
TYPICAL AFT OF CABIN
HOOKS
FRONT STRUT 1/8"x5/16" HARD BALSA
REAR STRUT 1/8"x5/16" HARD BALSA
1 1/2" WHEELS
SCALE PROPELLER 6" DIA. 3" PITCH FOR .049 ENGINES
LANDING GEAR WIRE BENDING
3 5/16"
5 7/8"
9 1/8"
5 3/4"
Fieseler Storch
FI 156
DESIGNED AND DRAWN BY
C. G. AHREMARK
FRONT VIEW
1/2 SCALE
0 1 2 3 4 5 6 7 8 9 10





Converting to 27 1/4

By HOWARD McENTEE

■ Now that we have an R/C spot at 27.255 mc., owners of some 50 mc. R/C outfits will want to change over, so they can operate without any license worries. Those who have built their own equipment will probably have no great trouble making the shift, if they will follow the notes here.

The transmitter and receiver we converted is an RCH, a good choice since it is typical of probably a majority of the equipment used on 50 mc. The receiver employs an RK-61, and the transmitter a 3A5 in the standard push-pull oscillator circuit. Owners of other makes of apparatus will be able to follow virtually the same procedure we used, providing their equipment employs these same tubes (or the XFG-1, in the case of the receiver).

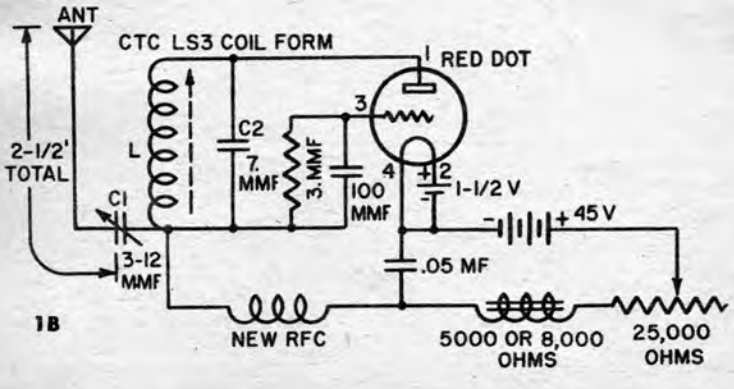
Let's start on the receiver, since it is the easiest. The original gas tube circuit of most of the receivers used on 50 mc. is shown at Fig. 1A. The only change needed is in the tuning circuit. On the RCH receiver, we found it necessary to change only the coil L and the choke RFC. L was made of 15 turns of #18 wire 5/8" dia. and 1¾" long. RFC has a form 3/16" dia. and about an inch long, with a 13/16" long winding of #34 enamel wire. This is not at all critical, but if you make any change, make the form larger. An ordinary carbon resistor of about 1 meg. value, and with a body of the above size or larger makes an ideal choke form, since it has the leads already on it.

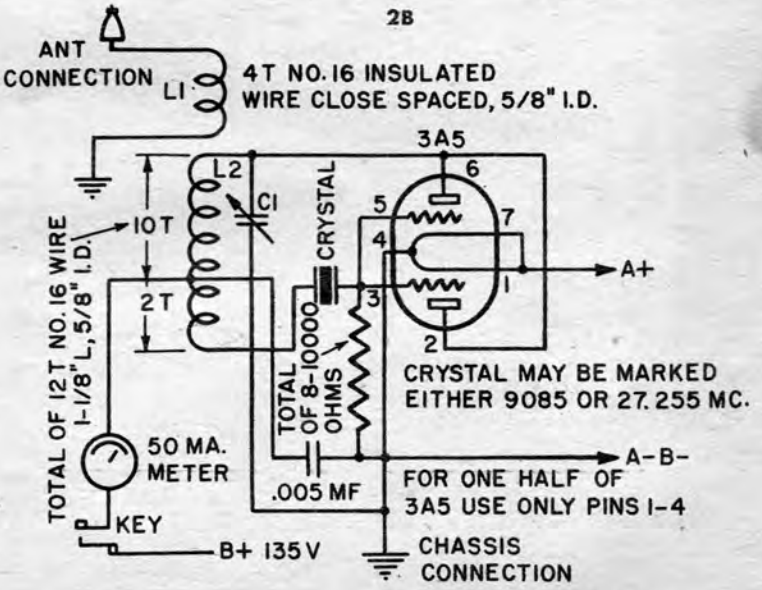
It is OK to give the choke a *thin* coat of model dope to hold the wire in place. But don't let it get too thick.

The set-up described worked nicely with the RK-61 but was rather inconvenient since tuning had to be done by squeezing or spreading the coil turns. In order to make the receiver work with either the RK-61 or XFG-1, it was necessary to go to the circuit of Fig. 1B. Since more turns were needed on the L, a CTC slug-tuned coil form was used, and this also allows easy tuning to the transmitter frequency. This circuit gives about equal results with either of the gas tubes. The antenna we used is about 2½ ft. long and C1 should be near the minimum setting (with the metalized part of the movable plate away from the mounting holes). As the tube gets older, it will probably be found that this condenser needs to be set at higher capacity, and it may also be necessary to lengthen the antenna.

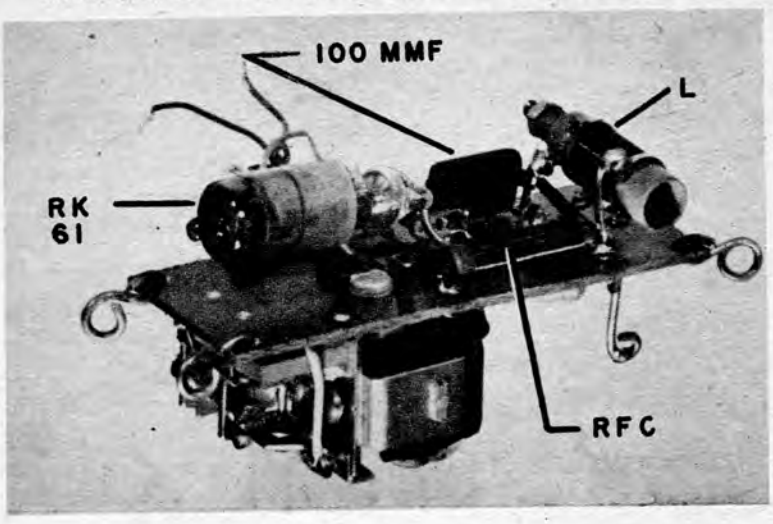
The receiver was operated at 1.2 ma. with either tube, this current dropping to .1 ma. on reception of strong signal. We used 7 mmf. for C2; if you can't get

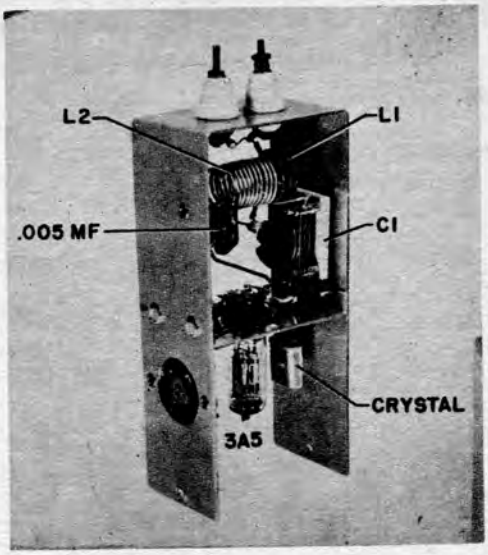
Headin' for the license-free band? This conversion job is easy and with Mac's instructions takes little time





Revamped RCH 27¼ rig is not too different from the "50"





this value, most radio supply houses carry either 6.8 or 8.2 mmf., and 10 mmf. will also do, though the latter is a bit high. These are all fixed ceramic condensers.

It was found that the set worked best with the leads from the tube connected exactly as shown; the plate lead is the one with the red dot, and is considered #1.

The transmitter is another story. It has to be changed radically, but we were able to use most of the pieces, including the 3A5 tube. Practically all 50 mc. R/C transmitters have a circuit very similar to Fig. 2A. This is called a push-pull capacitive feedback circuit (for those few who are interested!), but it cannot be well adapted to crystal operation. The final circuit is shown in Fig. 2B. This circuit makes it mandatory to use crystals of the tiny metal-cased variety, such as the Petersen Z9 or James Knights H-173. This transmitter, if made as specified, cannot operate on the wrong frequency, that is, if you have the correct crystal.

In this way it differs from other transmitter circuits that have been printed in Air Trails and the 1952 A.T. Annual, though these circuits could be used with practically any make of crystal; the circuit of Fig. 2B requires very active crystals.

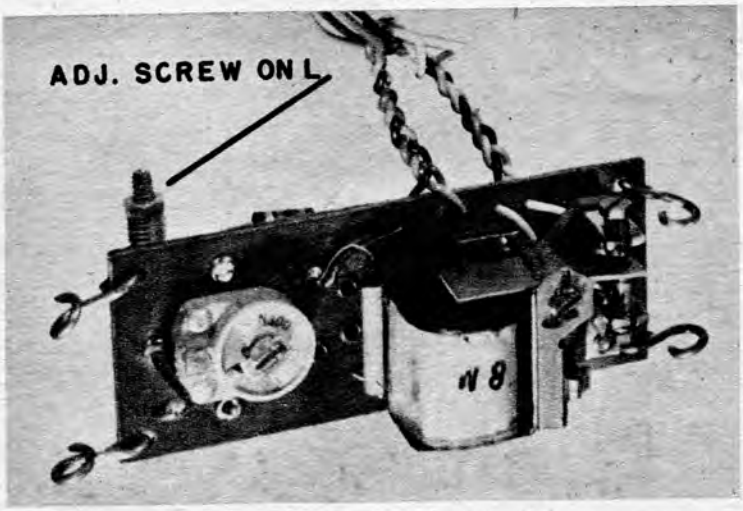
The RCH transmitter is housed in a small aluminum case, and has a double section tuning condenser. To make more room, we split this condenser, taking off the entire rear half. Also, the two semi-circular plates from the discarded half were slipped on the shaft, in place of the two disc plates. This latter operation just gives a wider range of capacity variation.

Most 3A5 transmitters have two grid resistors of from 15,000 to 20,000 ohms. We found the former value in this transmitter, and they were used in parallel in the final circuit. A single resistor of about 8 to 10,000 ohms would do as well. The two condensers C2 and C3 of Fig. 2A were discarded. Note that the new circuit has the two sections of the tube connected in parallel. You can use only one section if you wish, obtaining less power, of course, but the output will be ample for most R/C purposes, and the drain on the batteries much less. Also, with only one section, it is virtually impossible to harm the crystal; with the circuit shown, damage *can* be done, but we'll tell you later how to avoid it.

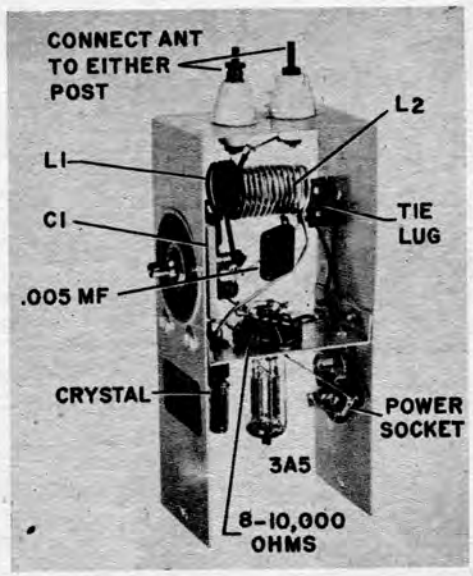
Provision must be made for the crystal socket; in this case it was mounted alongside the tube. The new coil L2 is supported only by its leads. To tune properly it was necessary to squeeze the turns quite closely together, and care must be taken to see that no turns short, especially where the tap comes off.

In converting other transmitters, where the layout may be entirely different, try to get the parts located so that the leads are fairly short and direct.

Most 50 mc. transmitters used twin lead for the antenna lead-in. The RCH has two insulators on top of the case for such a (*Continued on page* 74)

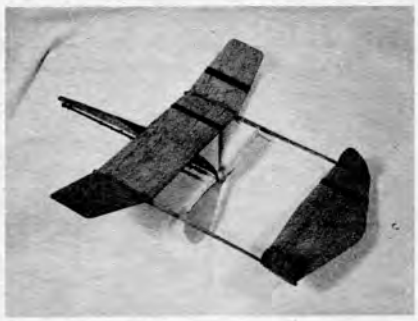


Receiver (above) and transmitter (right) after change-over



TWIN-FIN TERROR

By ANTHONY D'ALESSANDRO



You'll liven up any club session with a duration contest; does 2 minutes!

■ Here is a mite of a pusher designed to put some enthusiasm into those dull club meetings you've been having lately. Light, soft wood was used for everything except motor stick, which is cut from medium-hard quarter-grained balsa. All parts were sanded before assembly to reduce weight and eliminate surface roughness. Check alignment while assembling. There is 1" dihedral under each wingtip.

Propeller is carefully carved and sanded from block shown or from a machine-cut blank until it resembles a twisted piece of heavy paper. An eighth of an inch should be cut from each tip, making it possible to clear tail booms.

I gave ship added appearance by painting a washy solution of red dye and alcohol on it. I also striped wing and tail with black Jap tissue, using thin clear dope as adhesive, and painted a cockpit on motor stick.

Power was supplied on original model by a 10" loop of 3/64" rubber. However, thickness of strands and length of loop can be varied to suit weight of ship and height of flying site. Use lubricant on rubber and mechanical winder of some sort. Remember to wind backwards.

Adjustments can be made by rudder tabs, rear part of stab, wingtips or addition of small bit of clay to nose. My model turns to left under power and I warp down the trailing edge of the left wing.

Remember, lightness is prime requisite for good flights on this ship. Top times on the original averaged between 1 minute, 30 seconds, and 2 minutes in a low-ceilinged gym. Although this may seem like exceptionally high time, with a little practice you'll find even the "juniors" in your club can turn in some creditable performances with this little twin-fin-er.

PROP BLOCK LAYOUT

5

2

1/8

THESE PLANS ARE FULL SIZE

TISSUE PAPER STRIPES

BOOM POSITION

THRUST BEARING

BEAD

SHAFT

.014 PROP

THRUST LINE

.014 WIRE HOOK

RUDDER (2) 1/64 SHEET

GLUE STAB TO BOTTOM OF BOOMS

WING & STAB 1/32 MED. SHEET

GLUE WING TO TOP OF BOOMS

BOOMS (2) 1/16 MED. SHEET

FUSELAGE 1/16 MED. SHEET

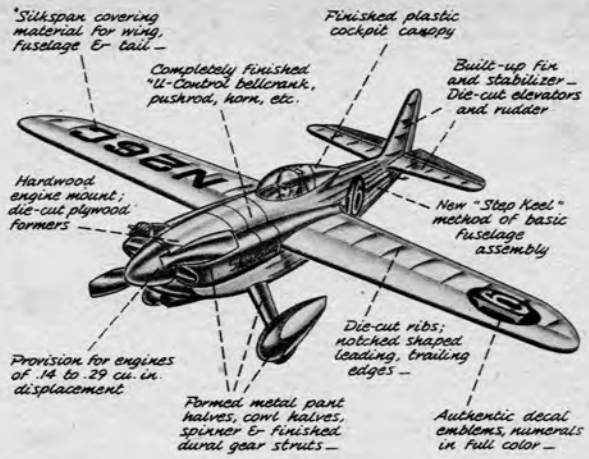
Shoestring Racer

■ One of the most attractive of the many Continental and Goodyear racer designs—and one of the most successful, too—is presented by Berkeley Models Inc. (West Hempstead, N. Y.) in the form of a 1½" scale model, intended for engines from .14 to .29 displacement. This exceptionally complete kit, which sells for $5.95, breaks a trend that has been growing in recent years, in that many of the formed parts are of pressed sheet metal, instead of the more usual plastic.

The 28⅜" span kit model is based upon a design in "AT" by Cal Smith, and is a close copy of the original ship; it is a natural for team racing, of course, but should be popular for just plain sport flying as well, especially since it is fully capable of inverted flight, and other stunts that this ability makes possible.

The fuselage is assembled over a "step keel" upon which the various fuselage formers slide; the keel assures that they are in the desired position and in perfect alignment. All stringers over the formers are 1/16 x ⅛" balsa; forward of the wing, the cowling shape is carried out by balsa sheet and blocks. The engine is mounted sideways, and the plans show exact installation of the McCoy .19, with recommendations and slight alterations needed to fit in any of six other engines. The "cheeks," a distinguishing feature of this ship, are ready-made of metal, and one must be cut out to fit around the cylinder. A special metal spinner made expressly for this kit lends realism to the nose.

The landing gear is based upon a finished piece of dural sheet, to which the metal wheel covers are bolted. The latter come in two halves, to make it easy to install the rubber wheels. The dural piece is bolted in a plywood mount in the fuselage. Complete hardware for this job, and all others where it is needed is supplied.


Silkspan covering material for wing, fuselage & tail
Finished plastic cockpit canopy
Completely finished U-Control bellcrank, pushrod, horn, etc.
Built-up Fin and stabilizer — Die-cut elevators and rudder
Hardwood engine mount; die-cut plywood formers
New "Step Keel" method of basic fuselage assembly
Die-cut ribs; notched shaped leading, trailing edges
Provision for engines of .14 to .29 cu. in. displacement
Formed metal pant halves, cowl halves, spinner & finished dural gear struts
Authentic decal emblems, numerals in full color

The wing is of built-up construction, with sheeted leading edge and center section. Shaped and notched leading and trailing edges make the assembly job an easy one. The section is symmetrical. Stabilizer and fin are built-up, while the rudder and elevators are balsa sheet. The plans show full details of the Walker-U-Control installation, and all parts for it are furnished.

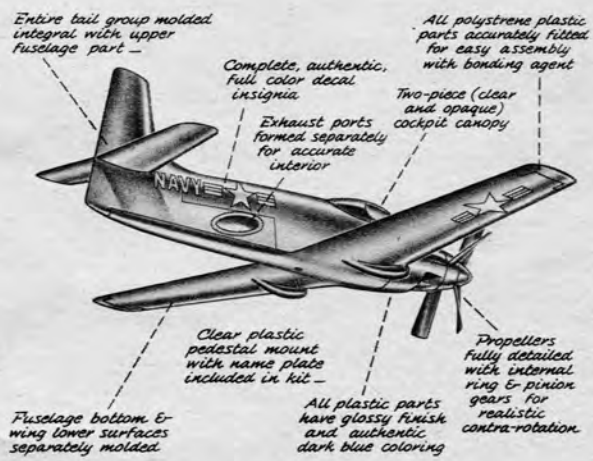
Paper covering is used on the model in all areas where the big ship is covered with fabric, lending further realism. A most complete set of decals enables the builder to duplicate the original to perfection. The usual Berkeley full-sized and highly detailed plan sheet is loaded with information on building and finishing.

Scale Skyshark

■ This absolutely exact scale model of the famed Skyshark brings to six the number of Douglas planes made by this old-line firm that have been offered in plastic by Allyn Sales Co. (Los Angeles, Calif.). All are represented in action, hence none is equipped with landing gear. Instead, they come with clear-plastic stands, each of which has the Douglas insignia and the name of one of the planes moulded in it. Selling for $2.49, the Skyshark kit is almost finished when you receive it. The fuselage, tail surfaces and the upper half of the 12½" span wing are all in one unit. (We'll bet the mould that makes this is at least as interesting as the model itself!) The lower half of the wing and bottom of the fuselage are another unit. These are of a midnight blue plastic, which simulates the finish of the Navy planes very well.

The various parts of the plane are assembled not with standard model cement, but with a solvent. Four different solvents are listed on the instruction sheet; one of them, carbon tetrachloride, is common in most households (put that fire extinguisher down, Junior) and will probably be used in the assembly of most of these Allyn plastic jobs. Mating surfaces of the various parts are simply moistened with the solvent, which softens them—then the parts are held together for a few minutes till the solvent evaporates, when they will be found firmly attached. Care must be taken to see that excess solvent does not run down on the polished surfaces of the plastic.

The twin propeller arrangement is very ingenious, for the two props are geared together, so that when one is turned, the other spins in the opposite direction. This is accomplished by installing a pair of tiny gears inside the spinners. Both props are set at very high pitch, and should rotate in a light breeze, if assembled carefully.


Entire tail group molded integral with upper fuselage part
All polystyrene plastic parts accurately fitted for easy assembly with bonding agent
Complete, authentic, full color decal insignia
Two-piece (clear and opaque) cockpit canopy
Exhaust ports formed separately for accurate interior
Clear plastic pedestal mount with name plate included in kit
Propellers fully detailed with internal ring & pinion gears for realistic contra-rotation
Fuselage bottom & wing lower surfaces separately molded
All plastic parts have glossy finish and authentic dark blue coloring

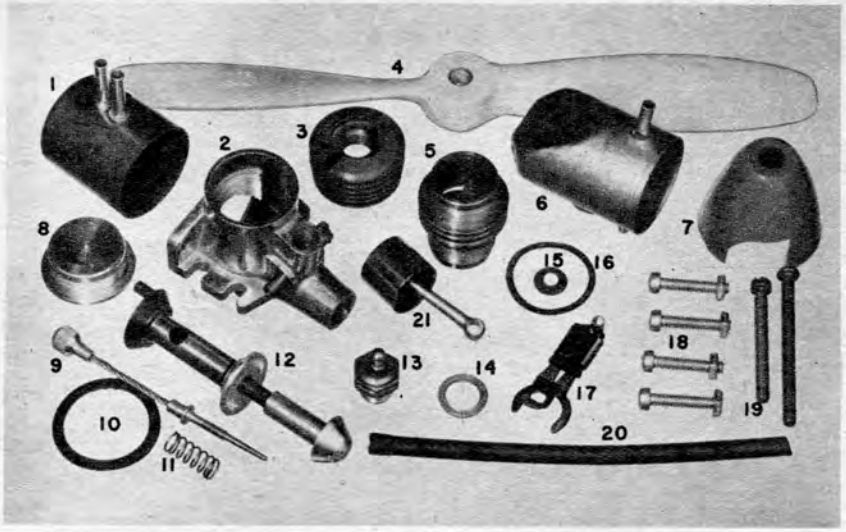
Complete instructions are included in the kit, as is a large photo reproduction of the big Skyshark, and silhouette 3-views of it. A complete set of decals enables the builder to attain true realism. This kit is intended to build up into a shelf or exhibition model, of course. Now, we wonder, who will be the first to fly one with Half-A power?

Other Allyn-modeled Douglas scale craft in plastic assembly kit form are the Skystreak ($1.79), Skyrocket ($1.79), Globemaster ($2.49), Skynight ($2.49) and Skyraider ($2.49). Boeing models are Stratocruiser ($2.49), Stratofreighter ($2.49) and the B-47 Stratojet ($2.49). Newest addition: Convair F-102 delta interceptor ($2.49)

MOTOR OF THE MONTH

WEN-MAC .049

Culver City Corp. comes up with hefty Half-A; healthy rpm's with little vibration



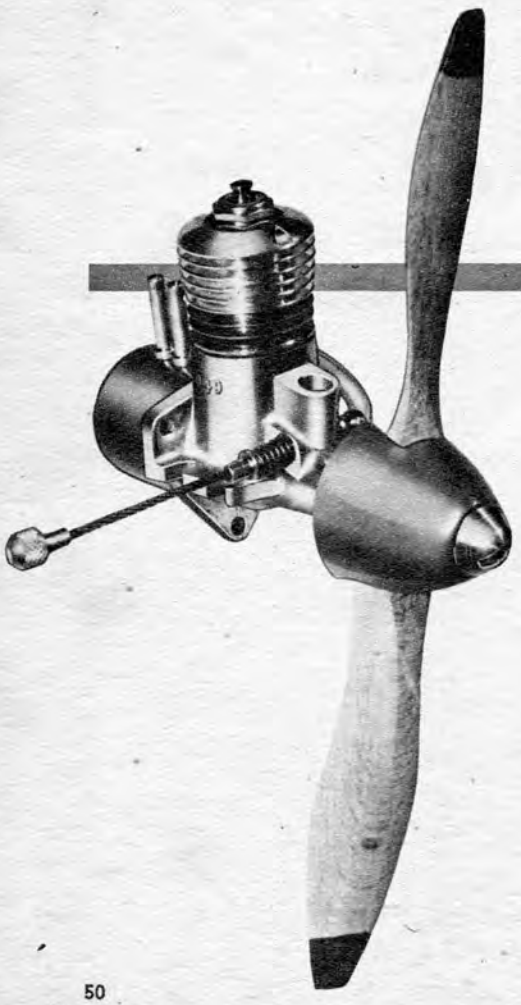
■ The Wen-Mac Corporation of Culver City, California, has recently entered the model engine field in a big way with the introduction of their neat Half-A powerplant. With the many accessories included in the kit, the Wen-Mac .049 can be adapted to all types of model planes.

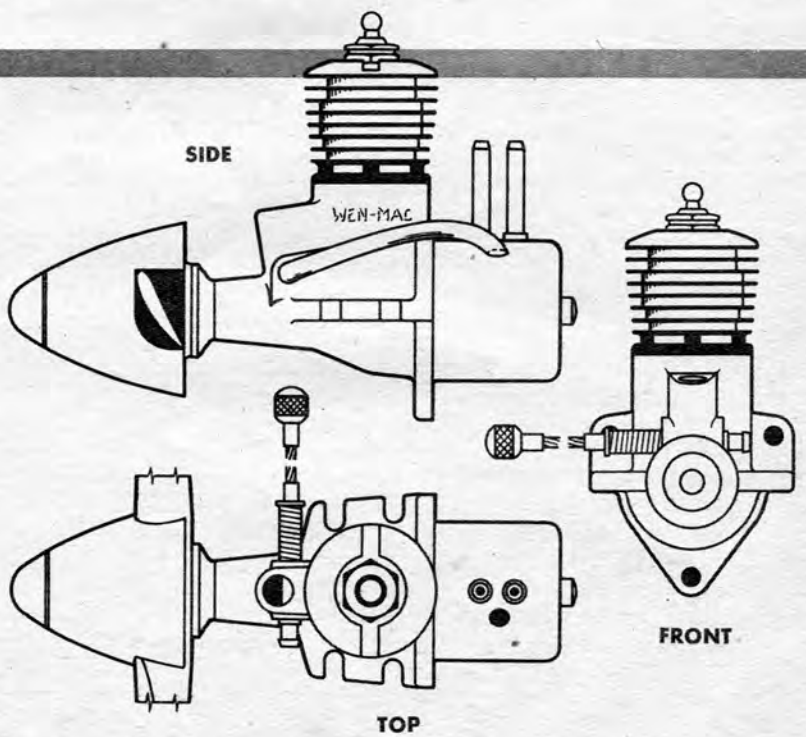
Two fuel tanks are supplied, one for sport flying and one for stunt. The stunt tank is slightly larger with top and bottom vents and a wedge design at the fuel suction point. A white plastic propeller and red spinner are also included in the kit which greatly improve appearance when installed in a ship. Other accessories include a universal wrench, fuel line, glow plug connector clip and mounting bolts. Batteries and fuel are the only "extras" to be purchased in order to operate the engine. Complete easy-to-read instructions are supplied in a manual.

External construction has been carefully designed for convenience to the modeler. Both radial and beam mounts are provided and the total weight is only 1.1 oz. without the fuel tank. Overall dimensions compare well with the smallest Half-A available. The needle valve is extended one and one-half inches to avoid tangling with the propeller when adjusting. Cutting away the radial motor mounts leaves one of the smallest and lightest engines with beam mounts for convenient installation in a speed ship.

Internal construction centers around the cylinder design. This has three milled exhaust ports and intake passages that connect with a 360 degree intake recess. Fuel is fed from the base through two bypass slots to the cylinder ports. The general porting arrangement is similar to the Atwood Wasp. A hardened and ground steel piston is used with a ball and socket type connecting rod. The steel crankshaft is hardened and ground and contains the rotary valve. A steel bushing is used for the main bearing to eliminate wear against the aluminum crankcase. The cylinder head screws on over the cylinder and carries five cooling fins. A red anodize finish on the head sets off the appearance. The base is a high-pressure aluminum die-casting with a smooth finish.

The test was started with a one-hour break-in. This limbered up the engine to give good performance in the slow and medium speed range. Another hour of running at high speed brought it up to 16,000 rpm Starting was best with a light (*Continued on page* 75)





Scientific launches the brand-new 1953

XP-300 "Dream Boat"

A sleek, modern speedboat featuring a brand-new revolutionary design

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- **NEW LOW PRICE!**
- **NEW EXCITING ACTION!**
- **EASY ASSEMBLY!**

Introducing the model-value of the year... Scientific's XP-300 "Dream Boat." It's years ahead in styling . . . featuring our exclusive Aeronautical Fin and Rudder design. Split-second maneuvering is achieved by air and water acting together on the rudder (which is both above and beneath the water surface). And, this ship-shape "beauty" is just loaded with quality features: 12" carved balsa hull, brass housing & propeller, dual balsa sponsons, decals, windshield, all hardware . . . etc. It's completely prefabbed . . . a cinch to assemble from the easy-to-follow plans. Takes a choice of powering, too: "½A" gasoline engines, CO_2 or electric motors. **$1.95**

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Another Scientific sensation! This deluxe model is 100% complete... with a 14" carved balsa hull and brass metal fittings. Takes "½A" engines or electric motors. **$3.95**

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R/C

(*Continued from page 17*)

Twin Cities M.A.C., May 30-31, will feature an R/C event. For info, write to P.O. Box 91, Yuba City, Calif.

Unofficial reports on the R/C event at the big mid-winter Tangerine Meet in Florida have it that R/C was flown only a few hours on one day of this four-day meet. Event was won by a Live Wire, and there were about 16 flyers on hand.

The R/C Contest Rules for 1953-54 have been announced, and as expected, there are a lot of changes. Interested flyers can secure a copy from AMA Headquarters. A brief rundown of the changes follows: All contestants desiring to make official flight will gather in line near the Dispatcher (with their ships). Those wishing to fly again after landing go immediately to end of this line. Contestant is allowed four minutes to get plane into the air, after he is called. A flight is considered official after four maneuvers have been judged. No points will be scored on any flight after eight minutes have elapsed from time of takeoff. *No testing of either transmitters or receivers* during official flying period. Scoring will be based on the highest total made during *any one flight* (maneuvers may be repeated during a flight to improve score, within the eight-minute limit.

Maneuvers are split into two main sections—Precision Pattern, and Stunt Pattern. It is expected that small meets will use only the former; large meets will require contestant to fly Precision Pattern first, then he may try the Stunts. In latter case, final score will be sum of points of best single flight in both patterns. Precision Pattern calls for set sequence of maneuvers requiring no acrobatic ability, followed by spot landing. Stunt Pattern need not be flown in any special sequence, has about same stunts as in past, but points have been re-allocated, and method of scoring is different. All in all, looks like a very good setup. 1953 will prove if this is so.

Technical Data. A good many of the 1952 Air Trails Annual receivers have been built and flown successfully. For those owners who want something more advanced, we suggest that they convert the old job to a two-tuber. The conversion is very simple; circuit is given herewith. The solid lines show the original circuit; dotted, the additions. Second tube may be gas type—either old or new—or miniature output pentode like the 1V5 or 1AC5 will work nicely. The rheostat is adjusted to bring the plate current of the first tube to around .5 ma. The second tube will idle at near zero, and plate current will jump to 1.5 ma. or more with signal. Resistance should be added in series with Meter 2, if the on-signal plate current goes over 2 ma. Advantages of this circuit are that both tubes idle low, which makes them last a lot longer. Also, tubes that will no longer work well in the usual single-tube receiver will work fine in the second position of this one. Our thanks to John Worth for this tip.

Al Trefethen tells us that the boys in his area have been using a receiver similar to this; they find they sometimes have a bit of trouble with relay chatter. This can be cured by adding a gridleak to the second tube, as shown in the circle. Start with 1 meg., and reduce this till the chatter stops.

Ray Morgan, proprietor of Ray's Model Shop in Patterson, Calif., has been trying to locate a 2-speed engine system that will allow *real* low speed. He has tried spark ignition without getting the results he is after; also, spark engines in the .19-.23 class are scarce. Ray wants to be able to run the engine slow enough for decent ground-taxi work. Anyone have any suggestions on this, either for spark or glow engines?

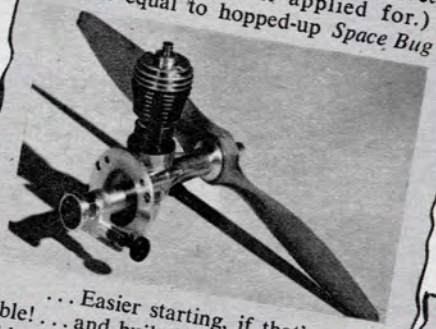
As far as we have been able to find out, no heavy-duty airwheels in sizes 4 to 6" are made in this country. They are much sought after by builders of large ships, however. We learn from Paul Johnson that they may be had from various model shops in England. He received a pair of fine six-inchers from Great West Models, 474 Great West Rd., Hounslow, Middlesex, England, at a cost of $9.80, plus 5% for shipping. 4½"

(*Continued on page 54*)

Thimble Drome BREAKS THE NEWS

THERMAL HOPPER .049 A NEW STAR IN THE SKY!

You asked for it . . . now here it is! A free-flight engine that has everything you ever wanted. Equipped with a brand new Thimble-Drome Multi-Jet Carburetor! (patent applied for.) Power equal to hopped-up *Space Bug*



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Now—a control line reel built just for NYLON lines for those ½ A jobs. Every feature you could ask for is incorporated in this reel! Spools turn independently for reeling out line and adjusting control position. A flip of the

knob and one crank winds in both lines! Positive lock in flying position. Completely disassembles and reels removed in 5 seconds or less. Made of high impact plastic . . . two beautiful colors. Get a Thimble-Drome *SKYLON* today . . . . . only **$1.49**

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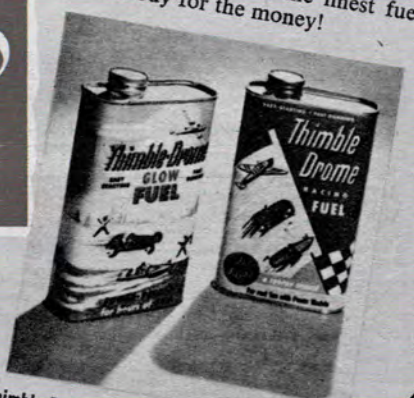

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U-Control Combination	$6.50
Back Cover	.50

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(*Continued from page 52*)

size costs only $3.65. Money is best sent by International Money Order (from your local Post Office) and Paul received his about a month after he had sent his order.

Users of the 465 mc. Macnabb receiver have had difficulty getting it to operate fast enough for pulse work, or even to be used with a fast-turning Beep Box, but a simple modification will take care of this. The 2 mf. electrolytic condenser that is mounted next to the relay should be replaced with a .5 mf. paper unit; that's all there is to it! Whereas the receiver would only operate at about one pulse per second before this change, the lower capacity will allow good pulsing at as high as 165 pulses per minute. No change in receiver operation can be detected. Incidentally, Claude McCullough, who sent the above tip, finds that the range of the receiver may be improved by using higher B voltage. With 90 V., the range is fine, and the current goes up to about 2 ma. with signal.

Q & A. Vic Seppanen, Brockton, Mass., says he has a Super Aerotrol in a Robot, and the combination works fine. Trouble is, the B drain is too high (he didn't say *how* high) and Vic wonders what he can do to lower it. This and similar gas tube receivers idle at about 1.3 ma. The only way to get much lower idling current is to convert the receiver to a two tuber—the extra tube may be added as was shown for the A.T. Annual receiver in this Column. This cuts B drain, but doubles the A current required.

David Anderson, Windsor, Conn., is a towline enthusiast, and wonders if the Jasco 72 or 100 could be used for R/C. They sure could, and many are being flown this way. Dave also wants to get another control on just one radio channel. Simplest way to do this is to use an escapement fitted with a pair of contacts, which work another escapement when desired. The Bonner Compound is of this type. This should answer Ward Van Duzen, New Bloomfield, Pa., who also asks what additional tools or equipment he will need for R/C work, aside from the normal model making tools he has.

About the only "tools" required are test meters for checking the batteries, and setting up the receiver and transmitter. There are low-cost test meters on the radio market that include several volt and milliampere scales; also, Vernon C. Macnabb Co. and Control Research both sell multi-range R/C test meters just for this purpose. Many R/C flyers get along with a single milliammeter of about 0-3 or 0-5 ma. range, to check the receiver. An insulated screwdriver is often handy to tune the receiver. These operators don't bother to test batteries—they just throw them out when the equipment seems to need new ones!

Commercial Dept. Not much new this month, but there *is* one thing we would like to bring up. We receive occasional complaints from readers, who have seen items mentioned in this Column or in the ads, stating that they have sent money to this company or that but have had no acknowledgment, nor have they received their order. Now, it should be understood that some makers of R/C apparatus are rather

(*Continued on page 58*)

Wakefield Meet in England

As a part of the Coronation ceremonies the 1953 Wakefield competition will be held in England on August 1, 2 and 3 at Cranfield. The size of teams representing each nation has been cut to 4 men. At about the same time the international free flight event will be run off as well as the F.N.A. Cup contest for Wakefield team flying.

U.S. qualification meets, each to provide one man for the Wakefield team, are expected to be held in Oklahoma City, Detroit, Langley Field and Sacramento. It is anticipated that an American free flight team will be similarly selected.

POWERFUL FUN...

With a Jim Walker "Firebaby" you can know the thrill that only a pilot knows — the high-pitched roar of the engine... the surge of power as the plane leaps into the air... the satisfying response as you move your wrist... the thrill of stunting with wings...

Buy the "Firebaby" ready-to-fly, complete with modified *"supercharged"* Royal Spitfire engine, controls and lines, all parts finished, painted and fuelproofed. Span 19 in., wt. 3 oz. **$8.95**
With Wasp .049 or Cub .049X engine, $7.85
Without motor, $2.50. See your dealer today.

Jim Walker
A-J AIRCRAFT CO.
PORTLAND 12, OREGON, U.S.A.

Grand action shot of the Amazon 1000 taking off. This came in from Dr. Stan Hill who was smart enough to marry the model's designer. Says ship has another win—took 2nd in Cl. A at Bakersfield Gas Modelers meet (see Feb. "AT").

Divorce rate rising for married modeling set?

■ Lots of fascinating news this month, friends. Hard to know where to begin. But one item did catch our eye. It was a cartoon in the CCAMA NEWS. (As we recall, CCAMA stands for "Connecticut Chapters of the A.M.A.", but nowhere in the latest bulletin does it say.) Very weary wife is slumped in a living room chair with sad expression on her face. Husband stands by with hands in his pockets and a sneer on his face and is saying, "I'm sick and tired of wearing myself to a frazzle, picking up after you. When you finish painting my airplane, CLEAN THE BRUSHES!"

Ha, ha, we thought. Very funny. But, of course, it couldn't happen . . .

Along comes a newspaper clipping from Jim (the A-J Ace, himself) Walker. Shows very attractive 29-year-old Australian war bride who had been just granted a divorce out West. Headline read: "Divorce—Sheds Mate Who Had Yen for Model Planes." Turns out all her husband wanted to do was fly model planes out in the park, many of which he made her make. She didn't object too much to spending most all her time with the cement tube and razor blade, it's just that the model building interfered with her work as a cashier.

How come the husband was able to fly night and day in the park without being run off by police?

Simple—he was a deputy sheriff!

Back to the CCAMA. That Nutmeg outfit sounds like a real bright gang. Women's Auxiliary and all. Meetings are held occasionally for subjects to be discussed other than model airplanes. F'instance, the Greater Hartford MAC challenged the New Britain MAC to a charade contest. Top performance of the last contest season was by Dick Matava who had everyone hysterical during his portrayal of Marilyn Monroe.

From the last bulletin we got the lowdown on Christmas presents as reported by one of the ladies: "What did the big boy give you for Christmas? Each Christmas my hubby really shows his true colors. Each Christmas I resolve never again to complain about spending each Sunday on the flying field. This year I received a 'Super Aerotrol' radio. I had in mind an RCA Victor for my kitchen, but he says this is just as good. It is the 'build-it-yourself' variety. This is to give me a feeling of accomplishment. It doesn't look like much, doesn't even have a fancy case, but he is building something for me to put it in. He must be going to surprise me as the only thing I can see that he is building is a Super Brigadier. I like it much better than the Real McCoy .19 I got last year. It was very nice, but I just as soon have had an imitation Sunbeam mixer."

All club councils, federations, etc., should keep abreast of Connecticut activities. To secure a copy of the CCAMA NEWS contact Dick (Monroe) Matava, 358 Prospect Ave., Hartford, Conn.

Florida Fracas. Word drifts in from the Tangerine Internationals. No official report, sorry. Just word of mouth. We hear George Fong did 130 mph to take first in Class C with a Hell-Razor and a brand-new McCoy .49 right out of the box. "Doc" Marchese took 1st in D with a modified Hell-Razor and a McCoy .60. His time was 153. Both are from NYC. Quite a jaunt.

R. H. Elliott writes that four Atlanta lads walked off with 12 trophies from the Orlando contest. Bob Elliott's "Black Tiger" (February 1953 "AT") took first in open stunt and Harris Grimes, a senior, flying a sister ship of the same model took first in senior stunt. Bob's ship was only one point off perfect on appearance and his pattern score was 384. No one was within 30 points of his score. The plane has been kitted by Berkeley.

Commercial News. Speaking of the manufacturers, as we just were, the boys at Sterling tell us that their kit #S-4, formerly known as the Space Kaydet, is now called Space Master, Jr. Everything else remains unchanged: box exterior, innards, etc.

Films for Meetings. The Plymouth folks have a new 16-mm film in color and with sound running for 30 minutes and covering the last Plymouth Internationals in Detroit. Talk to your local Plymouth dealer about getting a print for showing; he, in turn, contacts his district manager.

If Trans World Airlines has one of its 60 sales offices in your vicinity talk to the manager about scheduling some of the many sound movies TWA has that run from 11 to 40 minutes and cover a variety of subjects from behind-the-scenes story of modern airline operation to travel in the Southwest, Western Europe and the Mediterranean. One called "Overseas Run," compares passenger flights over the Atlantic with Lindbergh's flight of 26 years ago.

Down Texas Way. We get so little real news from the speed bugs that it's a real pleasure when we hear in length from a chap like Leo R. Holliday of Mesquite, Texas. Only Leo calls it CLEMville, Texas. If you don't fly speed models you wouldn't understand that; if you do and have come up against Jim Clem, the Whammy man, then it's all too apparent. Well, anyhoo, here are Holliday's comments:

"Since most modelers are in the work shops creating new designs or reworking old ones for the coming season, I thought I'd report on the Texas area. We are still having contests due to the more favor-

Wasp-powered Half-A team racer built by R. J. Fetzer of Sioux Falls, S.D., who's a member of the Pylon Pirates Model Club. Maroon colored McBrayer-designed Sizzler has 16" span, 5½ oz.

Don Hoag, youth director at Newark, Ohio, YMCA, built this original Fox .35 flapless stunter. Span is 51 in., weight 34 oz., does 65-75 mph. Duplicate will have inverted powerplant.

able winter weather in these parts.

"The most active area in U-control is Fort Worth, which is still having a monthly contest. The Fort Worth club has been having monthly contests for the last three years (had only two contests called off because of bad weather). Things are really beginning to pop over there. Some of the very active boys that were taken away by the Korean War are beginning to come back and they are really getting into the swing of things. The boys that were hot-rocks in combat a couple of years ago are beginning to revive that event.

"The real events that are picking up are speed. Class D speeds are well over the 140 mark. Th last contest had a rather rare entrant in this class. Dock Baker of Austin, who is a race car boy of some renown, had a Hornet .60 ship. He had one of those race car tanks in it and consequently turned many, many laps, but the Hornet never really leaned out. The speed was a little over 120 mph. Frank Stone is the boy to beat in this class, as he plays close friends with the 145 mph mark every contest; he made one 150 mph flight.

Really original team racer snapped at the last Nats by H. A. Thomas. Called the "Little Imp," it was entered by Tom Wing. Held here by Bobby Tom; nice change from usual configurations.

"Class B speed has really become a rat race. The top boy is Bill Timmons of Fort Worth. He hasn't turned under 128 mph in many a contest. Two of his running mates, Ed Rankin and Bruce Norman, never fail to beat the 125 mark . . . At this time last year, the meet record was 118 mph. At the present time, there are eight boys that better 125—consistently. Timmons holds the meet record at 132.32 mph. Ed Rankin turned 130.42 mph at the November contest. In slight defense of yours truly, I duplicated Rankin's fine feat at the December contest. Oddly enough I ran a stock Dooling .29 (with the exception of a shim behind the rotary valve) and stock 'This Is It' fuel.

"The most outstanding class at the monthly contest (*Continued on page* 78)

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(Continued from page 54)

small-time operators; they have no large staff to fill orders and answer letters. Still, one thing they *can* do is to acknowledge orders. It only takes a tupenny postcard and a minute to do this, and saves a lot of hard feelings. Don't forget, you small manufacturers—and some of the larger ones too—a lot of advertising in this R/C business is by word of mouth. An outfit that never answers letters won't be in business long!

Good relays are getting scarcer all the time. An item of interest in this line is a Sigma 5RJ at $3.25, listed by Relay Sales, 4721 W. Madison St., Chicago 44. This is similar to the famous 5F, but is in an easily opened case. Resistance is 8,000 ohms.

Interest in the International Radio Controlled Models Society is spreading. American branch is based at Pacific Radio Control Society, Box 762, Walnut Creek, Calif. In addition to the interesting Bulletin, the IRCMS has a long list of pamphlets on many types of receivers, transmitters, actuating equipment, etc. At present there are 26 of these pamphlets; average price is 20c. Write to the above address for info on the Society, and list of these publications.

Another new ship designed expressly for R/C has been announced by Dmeco. It is a Half-A job of 34" span and 220 sq. in. area, for use with .049 engines. Flying weight is around 18 oz., bare model with engine weighing 8 oz. Construction is typical Live Wire sheet balsa, and the ship is called the L.W. Kitten. Designer Harold deBolt calls it a good "fun ship," which will give very snappy performance, but can be flown in very restricted areas.

—HOWARD MCENTEE

Red Air Force

(Continued from page 21)

equipped units are used for patrol and escort duties and their machines are fitted for in-flight refueling, the refueling probe being attached to the port wing leading-edge.

The qualities of the MiG-15 have been progressively developed since its service debut in 1948. The gap in quality between this fighter and the F-86 is small and may now be non-existent in view of the fact that late production MiGs have boosted jets and carry a greater weight of fixed equipment, *including gunsight radar.*

Russian development of radar gun-laying raises new discussions over the advisability of large-caliber cannon such as the 37-mm N gun sported by the MiG-15. While we cling to the caliber .50 gun and are switching to air-to-air missiles, the Russians are known to be interested in a combination of both large-caliber cannon and air-to-air rockets.

The RD-45 engine installed in early MiG-15s gave only 5,000 lbs. thrust, but the engine has been progressively uprated to 6,000 lbs. thrust dry, and 6,750 lbs. thrust with water injection, while further boosting has been achieved with short afterburners on the latest planes of the MiG-15 series. The La-17, which has made one brief appearance over Korea, is similarly powered to the MiG but is now thought to have the edge on the smaller airplane in level speed and altitude performance. This shoulder wing, rakish fighter has been produced in smaller numbers than the interceptor type MiG-15 and, with its longer range capabilities, approximates more nearly the F-86.

The main gap in the PVO round-the-clock air defense system has been until the past year its lack of effective jet multi-seat all-weather fighters. The appearance in Eastern Europe of two different multi-seat fighters with first-line regiments provides evidence that the Reds have now succeeded in bringing such aircraft to operational status. Well-informed intelligence circles do not be-

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lieve that these new Soviet all-weather fighters are technically comparable with the automatically controlled, pilot-monitored, interceptor fighters—as exemplified by the F-94C Starfire. The Soviet Union is expending much energy in developing an "automatic" interception system.

The first Soviet two-seat all-weather jet to be placed into operational service, and one which is now used by the PVO and the all-weather squadrons of the Soviet Air Fleet proper, is a development of the basic MiG-15 design, referred to by some sources as the MiG-15F. First observed at Finow, the main Soviet air supply base in Eastern Germany and command point for the Russian night defense of the area, the MiG-15F differs externally from the standard single-seater in having a lengthened fuselage and a bullet-shaped housing mounted in the nose intake and containing a dish-type A.I. scanner.

Like the MiG-15, the all-weather fighter is powered by a single RD-45 turbojet, combat power of which is boosted by an afterburner extension which results in the elimination of the cut-back under the tail that characterizes the standard MiG. By Russian standards, instrumentation is comprehensive, including A.I. radar, gunsight radar, blind landing aids, etc. The fuselage has been lengthened ahead of the wing, and the pilot and radar observer are housed under a long "greenhouse" type canopy. Wing leading edge sweep angle remains 42 deg., but wingspan has been increased slightly by the addition of rounded wingtips. The nose unit of the undercarriage is of twin-wheel type and standard armament is four semi-externally packaged 23-mm NS guns below the nose. The airframe limiting Mach number is about 0.9 and level speeds of 700 mph should be obtainable with the afterburner in use. The afterburner is likely to boost initial climb rate from 10,000 ft/min to upwards of 15,000 ft/min.

The other Soviet two-seat all-weather fighter is a twin-jet machine first described in the September issue of Air Trails. Designed by Artem I. Mikoyan, this clean, shapely fighter, powered by two axial-flow jets mounted in the wing roots, is in the same performance bracket as the MiG-15F and is reserved initially for PVO defense formations.

In heavier category is a fighter version of Sergei Ilyushin's Il-28 twin-jet attack bomber. Intended for long-range patrol and night intruder work, this airplane differs from the standard bomber version in having the under-fuselage radar bulge and the bomb-aiming panels in the nose deleted. The new "solid" nose section now contains A.I. radar and a battery of 23-mm NS cannon. The Il-28 night fighters usually patrol in pairs and the type is generally comparable to the USAF's B-57-A Canberra night intruder.

(To be continued)

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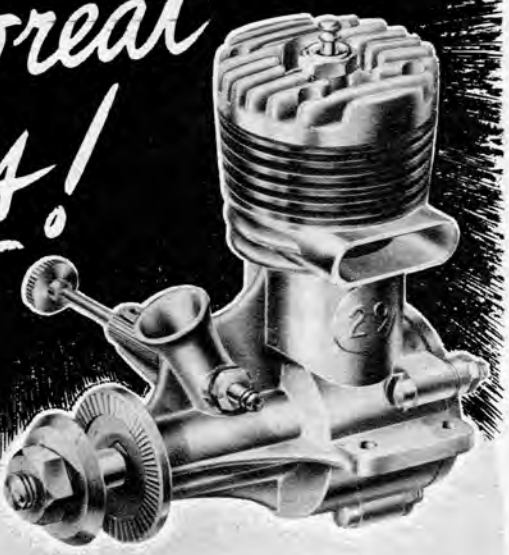

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Many New Powerplants Being Readied on Coast

■ Probably the very finest news out West is that there will be eliminations held for F.A.I. power models, for A/2 Nordics and for control line models, all heading towards a possible representation for the International Championship in Europe. These added to the existing Wakefield eliminations makes for a busy "qualifying" season.

With some very hard work, two winners will go to the championships scheduled for this summer. It has been suggested that these qualifying contests be held in a series of three so that the best possible, most consistent models be our representatives. Here in the West, this does not present much of a problem since good flying weather is always with us and contests are held the year around. Local eliminations could be held all over the West, with the top flyers going to a centralized locality for the finals. These finals could be a two-day affair, with three flights each day; from these, the two flyers with the highest average through the nine flights would be chosen as our representatives.

Foam Plexiglas wing mount on a Wakefield model by Don Conns. Very light and amply strong, reports WR's man Everett. Looks like logical solution to problem of sturdy platform.

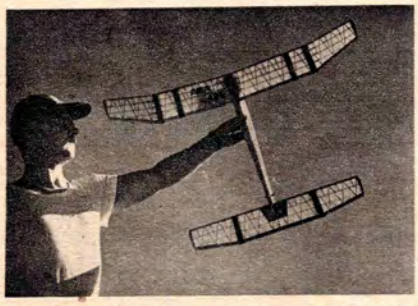
Since there is a five-minute limit on flights and each contestant is allowed two models, this does not seem too much to accomplish.

The models are necessarily small since a .15 displacement engine is the largest used, and hence the models can be constructed quickly. The rules are as follows: power loading 115 ounces per

cubic inch displacement; area loading, 2.63 ounces per 100 square inches of wing plus tail, cross section area squared, divided by 80. Simple enough. To figure minimum loading, multiply the displacement of your engine by 115. To get minimum size, divide this answer by 2.63, then multiply this by 100. This gives you wing plus tail area.

Yep. It had to happen sometime: "El Delto" by —guess who—correct! Old man Everett himself. This craft weighs 7.5 oz. with Cameron 19, has span of 14 in. How fast? Dick doesn't say, sorry.

If you want to build a larger model add up the wing and tail area, divide this by 100, then multiply by 2.63. For an .049, this figures as follows for minimum weight: 115 times .049 equals 5.63. This divided by 2.63 equals 2.14; this times 100 equals 214 or 214 square inches. (See, Junior? You don't really need that slide rule.) For the other



Unusual construction of Wasp-powered Half-A free flight by George Wagner. "Indoor type" wing has sliced ribs with top ribs on one diagonal, bottom ribs on other. Weighs 5.5 oz.

example, suppose we use 250 square inches total. Divide 250 by 100, making it 2.5; this times 2.63 equals 6.57—meaning you must have 6.57 ounces for 250 square inches. Use the above merely substituting your engine displacement for the .049 example. For cross section for the 214 square inch .049—214 divided by 80 equals approximately 2.04 square inches.

For the Nordics: wing plus tail area must be between 490 and 526 square inches; weight must be at least 14.5 ounces and cross section area divided by 100. Also remember 328 feet of towline, so make (*Continued on page 70*)

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Death at Dawn

(Continued from page 27)

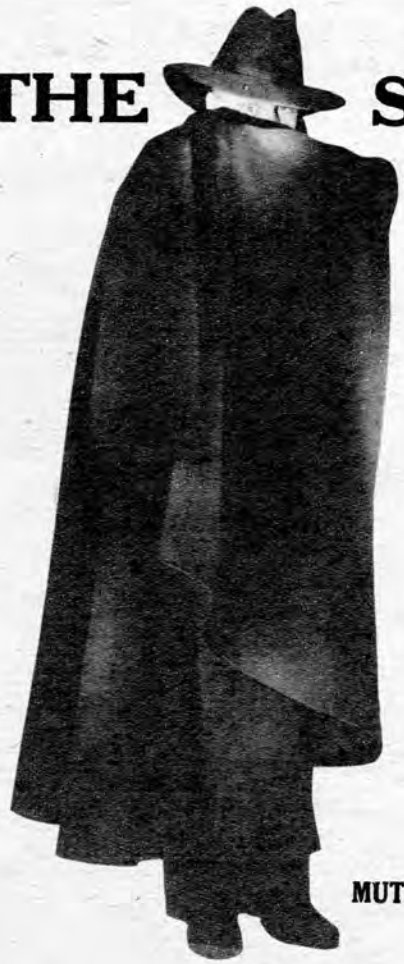
successful mission. India-born, the twenty-two-year-old pilot had entered the R.N.A.S. by transfer from the 2nd Sportsmen Battalion. He'd taken his first flying lesson on February 21, 1915, and qualified as a Flight Sub-lieutenant in early May.

Rolling pools of fog drifted in great patches and the propeller of his tiny, slab-sided Morane churned the grayish scud wildly. Occasionally he moved into clear air. Pilot-wise, ever alert, he glanced from side to side as he flew along. And then he saw it! One moment there was black nothingness, and the next there was a dim silhouette of a great airborn mass, almost invisible, hanging low over the rim of the coast. Zeppelin!

He threw the stick over, kicked rudder and swerved toward the Zep. Forgotten was his mission. Here was prey at hand! The Zep was the L.Z. 37, sailing back to her home base at Berchem St. Agathe after her abortive mission. Like a hunter stalking a quarry, Warneford cautiously trailed the sky giant, thoughtfully studying her as he sped through the night.

The Morane carried six 20-lb. bombs; a pistol was slung from his hips, and a carbine was wedged in the small cockpit with him. These, then, were the weapons available to engage the Zep in combat. The Zep had more power, and several crack machine gun crews in her gondolas. Warneford didn't ponder the comparisons; he prepared to attack.

Zooming after the "37," he caught up with her over Bruges. Seconds later, the wide-awake gun crews in the gondolas sighted the Morane and the night immediately echoed to the snap and crackle of



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machine gun fire. For a fleeting moment, tiny airplane and giant Zep rocked along side by side as slugs lashed about Warneford's head. The young pilot needed no further urging to quit the vicinity at once. He whipped the Morane around in quick retreat, climbed away from his precarious position and sought the advantage of altitude.

Pistol and carbine he realized would be useless against the machine guns, but his light bombs offered distinct possibilities.

He glanced over his shoulder and nearly fell out of the cockpit; his adversary was swinging into a wide, climbing turn in pursuit of him! Obviously the commander of the Zep was as ignorant of dueling with planes as Warneford was of dueling with Zeps, for in this maneuver he committed a fatal error. Instead of fleeing and seeking an altitude beyond the Morane's ceiling, he was bringing his highly inflammable craft within reach of the Morane's bombs.

For the moment, though, the strategy favored the Zep. Warneford hadn't counted on this twist and he taxed his bomb-laden plane to escape from the machine gun fire that darted up toward him. At 11,000 feet, still above the Zep, he hauled the Morane around in a tight reversal and ran his eyes along the more than 500 feet of the "37's" fragile and unprotected backbone.

He paused for a second, and then slammed the control stick forward and dived. Almost instantly, the German craft became a frightened monster; suddenly aware of her awkward position, she clumsily twisted and turned to escape, but the plane matched every move. Leveling off, Warneford flashed over his opponent—a bare 150 feet above her—and released his six bombs in rapid succession.

The first five were either duds or they failed to hit their mark, but the last one

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Using any 48 to 54 inch span—wing loading up to 16 oz. per sq. ft.

ENGINES: OK CUB .099, on this engine it is necessary to reduce the venturi opening by 50 per cent. This will allow better fuel adjustment for hand launching and violent maneuvers. Set needle on rich side of peak so that in climb engine is fully at peak RPM. ARDEN 099 works well as is.

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penetrated one of the Zep's large hydrogen bags.

For a fleeting instant there was no sound in the ominously still, dark heaven other than the beat of the Maybachs and the popping of the Gnome. Then with a suddenness that vibrated the sky, the L.Z. 37 exploded in a thunderous blast. The calm surrounding air was lashed and churned by the fury of the upheaval, and the artificially formed currents picked up Warneford's small monoplane and flung it crazily, end over end, across the sky.

Dazed, the pilot automatically went through the motions of securing control of his plane. Miraculously bringing it back to an even keel, he discovered that the engine was dead. As he struggled to start it, he stared, chilled and hypnotized, at the fascinating spectacle of the dying "37."

A section of the Zep had been torn off, but the remainder of the fat hulk glowed from end to end like a great, fiery Japanese lantern. Then new tongues of flame burst forth and additional explosions rocketed thousands of sparks that spun dizzily into space like miniature shooting stars. Night became day as the thick orange-red flames mixed with unfurling plumes of oily smoke billowed up from the burning wreckage as it roared toward the mute countryside below. A moment later, an oval of crackling flame splashed and scattered over the quiet fields, while tiny débris fires burned in the sky and gently drifted earthward.

Almost unbelievably, one lone crew member actually lived to fly again. He was Helmsman Muhler, a single occupant of one of the gondolas. During the blazing descent his car broke free and crashed through the roof of a convent. It killed two nuns, but Muhler himself survived.

Warneford was filled with shocked wonderment at the abrupt end the "37" had suffered at his hands. A 20-lb. bomb had reduced the costly, death-dealing Zeppelin to a mass of glowing cinders in a matter of seconds!

The failure of his engine to start brought his thoughts back to his own precarious position with a rush. Frantically he tried every trick he knew to coax the silent rotary back to life. It stubbornly refused to cooperate and he resigned himself to a dead-stick landing, in the murky, predawn light, in enemy territory.

He set the Morane down without damage and immediately prepared to set fire to it before his captors made an appearance. But when no sound of an approaching search party penetrated the silent fields, he paused in his exertions and transferred his attention to the dead engine. A hasty examination revealed that a joint in the fuel line had been ruptured by the tremendous Zep explosion.

Working feverishly against time he repaired the break and prepared to leave. Without a mechanic to aid him, he had to set the switch at "contact" and swing the propeller himself. He grasped the propeller and whipped it around; the engine had cooled off and still refused to start. He tried it again and again; suddenly it broke into life with a series of coughing blasts.

The plane was immediately in motion, moving rapidly forward. Warneford hopped to one side, ducked as the wing passed over him, then raced alongside the fuselage, grasped the cockpit coaming and swung himself aboard. He had been grounded behind the German lines for thirty-five minutes and he wasn't wasting any time in making his getaway!

He hauled the Morane off the turf and almost at once slammed into drifting fog. Flying in a steady westerly direction he landed at last on the top of Calais cliffs, near Cape Gris Nez, some miles from his home base, but in very friendly territory.

And what a reception his gang at No. 1 Squadron gave him! For the first time in history an airplane and a Zeppelin had tangled in combat high above the earth and fought to the death. Young Warneford had courageously pointed the way: the strongly armed, high-flying Zeppelins were extremely vulnerable. His victory, which occurred exactly seven days after London had been bombed, also gave the morale of the British public a tremendous lift. The Germans reacted too; with the L.Z. 37 smashed out of the sky, and the L.Z. 38 smashed in its shed, they hurriedly decided that their Belgian Zep bases were untenable and removed the remaining Zep, the L.Z. 39, far away to the Eastern Front.

New Officers for A.M.A.

Early reports from Washington indicated that the new president of the Academy of Model Aeronautics is Keith Storey of Pasadena, Calif., associate contest director at the last National contest and a design and production specialist with Duro-Matic Products. Keith is well known in team race circles as director of this event for the Plymouth International contest and as one of the originators of the F.A.S.T. club.

New secretary-treasurer is George J. "Curly" Clingman of Indianapolis, former C.A.A. official and instructor for the Allison engines division of General Motors. Mr. Clingman has been active in modeling for many years and is an experienced organizer of many meets and clubs. He serves each year as a special director of events for the Plymouth competition in Detroit.

No, the Zeppelins were not withdrawn from the conflict; larger, faster and in general vastly improved models continued to make war on the Allied peoples; but their ambitious program to crush industry and sow disaster was never fulfilled. Fast, high-flying night fighter planes, armed with incendiary-firing machine guns, improved anti-aircraft guns and searchlights, listening devices and a host of other measures dulled the lance of the Zep attack.

Warneford's victory thrilled the Allied nations. The French acclaimed his feat and the Minister of War awarded him the Cross of the Legion of Honor. King George telegraphed: "I most heartily congratulate you upon your splendid achievment of yesterday, in which you singlehanded destroyed an enemy Zeppelin. I have much pleasure in conferring upon you the Victoria Cross for this gallant act. George R. I."

In Britain, preparations went forward to give him a hero's welcome on his next home leave. Tragically, the celebration never occurred. Ten days after he had been awarded the V. C., he arrived at Buc Aerodrome, outside of Paris, to accept delivery on a new Farman biplane. An American correspondent interviewed him there. At the conclusion of the interview, Warneford invited the American for a flight in the new plane. Upstairs, the pilot put the Farman through its paces; evidently he roughed it up too much, for at an altitude of 700 feet it suddenly disintegrated and both men plunged to their deaths.

Exactly two weeks after his brilliant success, a train bearing the Union Jack-draped coffin containing Warneford's body arrived at Victoria Station, London. Vast throngs were on hand to greet the hero, in sorrowing reverence.

NEW LOCKHEED ELECTRA GAS MODEL

55" Span. 1" Scale. Free Flight, U Control, or Radio

This model will be in limited production during next few months; orders are now being accepted in advance. Uses 2 OK-.14 or any .19 type motors. Const. set will have 3" air wheels, alum. cowls and propellers. Const. set, without motors..... **$15.00**

CURTISS P40F GAS MODEL

48" Span. Free flight or U Control

Improved with new 2¾" alum. spinner and 3" Veco alum. disk semi-pneumatic rubber wheels. Planked type body, parts printed on balsa, and all parts. Set **$9.00**

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35¾" span, ⅞" scale. Length 30½". One-piece moulded, clear plexiglas cockpit enclosure. 2½" scale alum. disk rubber wheels. Body planking full size plans. Uses B or C motor. Set **$5.95**

BOEING PT17 GAS MODEL

45" Span. Can use 5 cyl. M5 Motor to scale or B or C Type Motor. U Control.

Set has scale rubber wheels and all spec. parts, ready cut wing ribs, tail wheel unit and wheel. Const. set **$9.95**

9' TAYLOR CRAFT GAS MODEL

9 foot span. Can use Radio control. Set has 36 ready cut wing ribs, cut plywood body formers, 16" carved prop. tail wheel unit, 2 full size plans, printed balsa, silkspan, etc. Uses "C" type motor, single, twin, or 4 cyl. motor. Set without motor or wheels, postpaid..... **$17.50**

Extra pair of 4½" airwheels, $3.00

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32½" Span. Length 22¾". 1" Scale.

A real collector's item. Finely detailed. Set has air wheels, ready cut pants, turned balsa cowl unit, parts printed on balsa. Const. set..... **$4.50**

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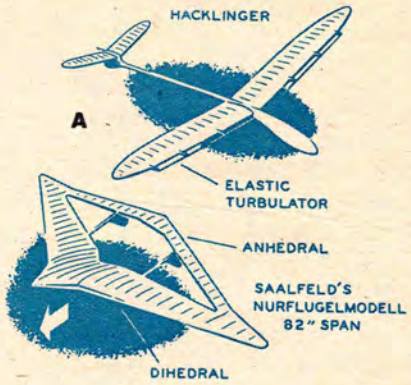
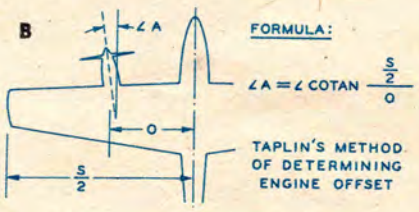
FOREIGN News-Notes

■ From E. London, S. Africa, Bob Masters —who is something of a whiz at speed and radio control flying—writes that formerly a $4 annual license was required of those operating on amateur radio bands and this year the rate was raised to $20! The subsequent howl set up by S. African modelers brought a partial reduction; the current

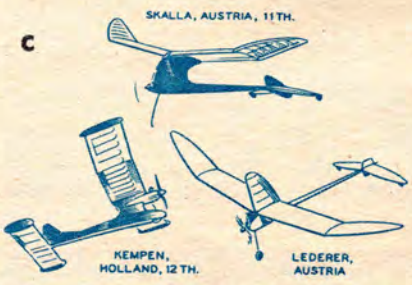


touch is $8 per annum. No tests required. The ticket is an experimenter's license for 27 and 53 mg. bands, allowing the holder to build his own equipment.

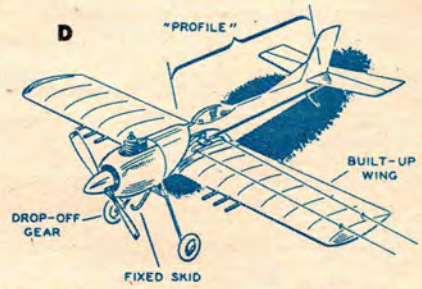
While German efforts in control-line appear somewhat primitive, their achievements in the large towline sailplane realm are noteworthy. Two representative examples of this type advanced model are: 1. Heinz Saalfeld's "Nurflugelmodell" (All-wing) of unusual configuration, the idea having been originated during the war and slowly developed through paper gliders to its present state. It has lately been Jetex powered. 2. Latest sailplane design by the "Bavarian Master" Max Hacklinger, of pod-and-boom style and finely detailed construction. Hacklinger fitted elastic turbulator ahead of wing leading edge but we gather this innovation brought no great flight improvement. (Sketch "A")



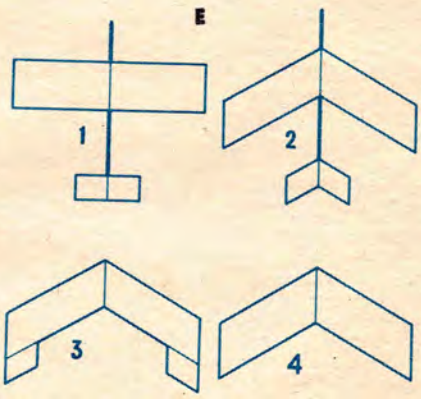
Those lovers of multi-engine freeflight jobs, R/C or flying scale, can profit from Britisher Col. H. J. Taplin's findings about



engine offsets to nullify turning action. The proper offset will enable a straight flight path even if one engine revs down or quits. Wingspan and the distance from center to engine location are factors in Col. Taplin's theory. (The farther outboard the location, the greater outward offset required.) He reminds that engine torque effect is lessened as the engine is moved outboard, though it is preferable to operate engines on opposite sides in opposite directions of rotation. (See "B").

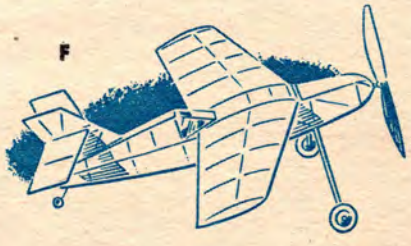


Zurich, Switzerland, was the site of the World Power Championships in September, 1952. With at least nine teams representing various European countries, the meet proves that proficiency in gas model free flight by these modelers is now on a par with that found anywhere in the world. Five-minute flights being the maximum allowed and a three-flight total determining the winner, top man was B. Wheeler of England whose ship was proxy-flown. Six top contestants totaled over 700 sec. each and the Swiss team followed by the Germans were group winners. While there remains some very original styling among

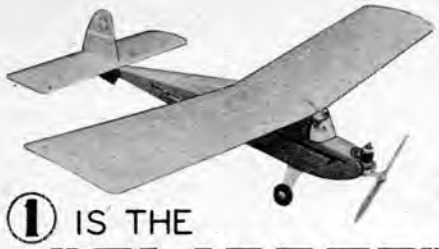


some Belgian, Dutch, Italian and Austrian models (see "C"), most craft appear quite conventional and employ all the usual dethermalizers, fuel shut-offs, gravity tabs, etc., that were used first in this country.

Marine Major Hank Bourgeois sends this column copy of new comprehensive Japanese model publication which, though titled "Popular Science," deals entirely with model aircraft and is filled with meticulous Japanese drawings and model theory from hand gliders through radio control. Much was material based on American practice (many drawings strongly resemble those in recent issues of A. T.) but rubber models particularly differ in their fragile construction of wings and bodies



"AKTENTASCHENFLUGZEUGE"
(PORTFOLIO AIRCRAFT)



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and use of bamboo, etc. Indoor flying well treated; general interest about equally divided between control-line and free flight. A compendium of engines lists 22 handsome Japanese types, mostly glow-engines, and a model jet engine is advertised. American military craft are popular subjects for flying and solid scale models. Unusual combat job (see "D") combines built-up and profile construction in fuselage, appears well designed.

The average German model builder seems to delve deeper into aerodynamics and theory than the typical American who in most cases first of all gains practical success with his model, then takes a backsight into the theory which made it possible. Pages of "Ikarus," a German model publication, carry a wealth of model theory material, and one diagram particularly impressed us. It is a diagrammatic explanation of the evolution of a conventional airplane layout into a swept flying wing. (See "E".)

In recent years abroad the N. F. A. Cup competition has been held, awards being made on a team basis with models of Wakefield type. Last year, in Rome, the British team of Copland, Warring, Dowsett, Yeabsley and Brockman won the trophy, all being well-known modelers. Copland and Warring are veteran competitors whose contest exploits are known and admired throughout the modeling world.

To encourage beginners particularly, a German model magazine has been fostering the construction of small, semi-scale rubber jobs called "Aktentaschenflugzeuge" (portfolio aircraft). Spanning 30-40 cm (about 12-14 inches), the craft are neat and simple, weigh in the neighborhood of 20-22 gr. (See "F" of attractive swept-wing craft built by W. H. Friese.)

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JASCO

Speed Bug

(*Continued from page 40*)

the bottom shell. Cut top and side to outlines with rectangular cross sections. Scoop out as illustrated so that the firewall bulkhead will fit snugly against the shoulder and sides. Bolt the engine to the firewall, using only two bolts on the top. Now align the bulkhead on the shell, cement it in place with slow-drying cement. Then apply Plastic Wood to form fillets behind the firewall and under the engine. The fillets behind the firewall will reinforce it and also prevent nuts from turning when the engine is removed. The Plastic Wood under the engine will make up a very strong unit which will take a lot more abuse than the shell would by itself. Put bottom shell away overnight to give cement and Plastic Wood time to dry completely.

The wing is shaped from ⅛" sheet balsa. Cut it to outline and sand to airfoil shape. Cement wing guide in place after using clear dope.

The cowling is made by cutting two sides to outline shown. The two sides are held apart to correct dimension by cementing them to the "cap." The "cap" can be shaped after cowling is cemented to fuselage.

Cut stabilizer to outline and sand to streamline section. Install horn when cementing cloth hinges in place.

After the bottom shell has set properly, fasten the spinner to the engine. Then start carving from the spinner towards the rear. The proper cross section will come almost automatically. Just be sure not to thin the wall too much.

The top shell is made from two 5/16" sheets. Before cementing them together, cut out holes for engine and needle valve extension in the "A" piece. And in piece "B", cut out area as shown to give enough room to tank and pushrod wire. Tack-cement the top blocks to the bottom shell. Place wing on top block and mark its position; remember to leave this area flat when carving the upper shell to shape.

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Answer the Call!

Cement wing in place. Next, fit the cowling in position. Check to assure engine alignment for ease of removal. It is advisable to place shim stock along the inner cowling wall where balsa may touch fins.

Cut upper shell to fit stabilizer which is secured with cement. Install bellcrank and pushrod. Make sure that they operate smoothly and freely.

Drill holes for tie-down bolts. Locate eyelets and cement them in place. Spread P.W. where nuts will be. Place nuts on bolts at proper distance, and bring the two shells together. Hold them so until P.W. has had a chance to set well enough to hold the nuts in place when the bolts are unscrewed. Next, sand entire model smooth with 400A paper. Now, lightly wet the entire model with water. When dry, re-sand with 400A. Apply a light coat of clear dope. Sand, and finish with two light coats of fuel-proofed colored dope.

After doping, separate the two shells. Attach lead-out wires to the bellcrank, and also a lead-out from the tip of the plug. Install the balloon tank which is held to the fuel line with copper wire. Cut spinner to fit the prop.

If the engine has to be test-run now, be sure you do so without the top shell in place to provide ample cooling.

Prop size and pitch are a critical point in any speedman's career. If the model is light and the engine "hot," the pitch can be increased and the blade area decreased. This combination can be used until the speed begins to decrease. When this point is reached, it is necessary to back off a bit by decreasing the pitch and increasing the blade area. By going through this procedure, the best possible prop pitch/area combination will be found or determined for your model and engine. A good start for the Speed Bug is a 5" dia. and 6" pitch. The area can be sanded off and pitch increased by steaming.

Before flying, make sure that all controls are moving freely and engine is running well. By doing so, you will "feel" the response of the model despite its small size and low weight.

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Western

(*Continued from page* 61)

the model stable under tow.

Build these models now and watch for the announcement for the contests; we will have them well in advance of the finals so that good models can be made.

We took a trip to Los Angeles recently to see what the Industry was doing and even though we didn't get to visit them all we found plenty of evidence of new things in store of all of us during the coming year. At the Cox Manufacturing Company, makers of those Space Bugs, we found good news for you free flight fans. They are working on a free flight adapter for their engine so that you will be able to use very easily, any one of the many fuel shut-offs. Cox also has a new Half-A reel coming out for you small engine fans. This reel will have only one crank on it but the reels will adjust individually. They are certainly tooled up for production, having an output as high as 700 engines a day. Rumor has it that they are also working on other developments, but Mr. Cox will not let them out until they are ready for the market.

K&B is going into the kit business with a free flight model which is a little bit "Zeekish." The model is longer, making it a much better power flyer—"higher and faster" is Lew Mahieu's way of putting it. Also in the mill are two new engines, a .09 and a .14, along with a new .19-.29 and a .32. These new engines will have a green head and boast of a satin finish for better heat dissipation. There will be improvements like blow-proof gaskets, a change in the compression ratio and better porting. They also have a new radial mount tank. Watch for them.

Duro-Matic promises to have their Red Head .049 diesel out which is supposed to be revolutionary. The experience they have had with the few that were made has enabled them to perfect it to a high degree. The only difficulty with the ones which were at the Nats was that they were hard to start; this has now been licked. You speed fans will see those ole "Red Heads" again on the market in a new and improved 1953 model. They are at the present time increasing their supply to meet the demand much as it taxes their engine runner, and we don't mean he runs with the engines.

One thing which can be said for certain, that part of the industry visited by us was certainly in production.

There haven't been too many contests, but the ones held were decidedly unusual. The Convair Aeromodelers held two meets, one a planned affair which, though having a limited number of contestants, provided good concrete information and experience which shows that meets of this nature are thoroughly enjoyed by both contestant and spectator. There are quite a few more modelers willing to accept this type of contest than there were before. It seems, from surveying the field, that it is as hard to change the criterion for contests as it was for Henry Ford to convince the public that the automobile was here to stay.

Luckily the day was ideal, for we were caught just a little bit flatfooted for measuring the spot landings. Another mistake made was in allowing only two points for each circle completed instead of the proposed ten. This placed such a high criterion on duration that all they had to do was land within 500 feet of their spot with a planned long flight. This is just what Jack Oxley and Dick Sladek did in winning the unlimited event and the PAA-Load event. Yes, Sladek won his fourth first place. And a watch, his fifth in all. By now he probably has a jewelery store opened.

It was very interesting to try to analyze the winners' flights. Sladek flew 161 of a planned 180 seconds for 294 of his winning 388 points. Sixty-four more of these were won in his landing. Jack Oxley flew 19 seconds longer than his planned 150 seconds for 262 of his winning 362 points. Seventy-five more points were won in his landing. A. P. "Speed" Wilson landed only 6 feet from his spot on one occasion for top spot honors. Bob Moncrieff, who won second in the unlimited event, was only 8 points off perfect for his spot and only 24 points behind Oxley.

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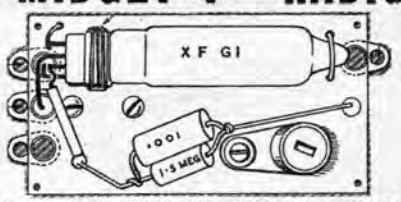

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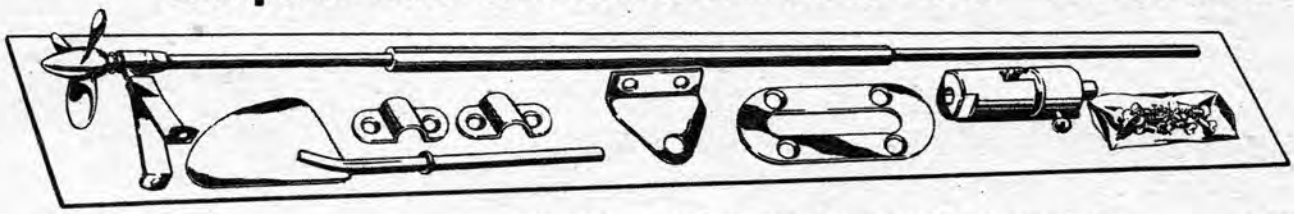

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One advantage to a contest of this kind is that any and all types of models from a baby R.O.G. to a huge 6-foot gas model can be flown on an equal basis. We had them.

The other unusual contest was a Turkey Fly for those luscious birds. Since the Aeromodelers have all types of model builders, the contest was held on a blind bogey basis where models were flown for flights between 30 and 180 seconds in free flight and in U-control at speeds from 30 to 150 mph. The contestant took his allotted flights and then specified which flight he wanted official. Times and speeds were thereupon drawn from a hat and the fellows in the bracket had a fly-off. There were ties. These were decided by having the guys make flights as close to their tying times as possible. The contestant most nearly duplicating his official flight being declared the winner.

A Wakefield model tied with a Class A gas model, the Wakefield winning the fly-off. A hand-launched glider tied with a Half-A PAA-Load model. Sladek won this one; you can't stop him. In the U-control events, most ships winning were stunt models, the fellows flying off to try to duplicate their points. This was the only method we could find which would enable all the members to have an equal chance.

We took in a team race held on the Santa Anita parking lot and sponsored by the FAST Club. We were very pleased to see the largest U-control activity that we have witnessed for quite a long time. The big parking lot was literally sprinkled with models of all kinds and descriptions.

Some of the nicest World War I scale models were on hand that we have ever seen. Somehow these old biplanes seem to draw the attention of young and old alike. Walt Farrell had a Bristol F2B fighter of 40-inch span which was sure pretty. There was so much good detail on the models that we just had to find out how. Walt uses a sheet balsa bottom for the wings, keeping them nice and thin. The leading and trailing edges are trailing edge stock, the exact number of ribs being cemented in place between these and on top of the sheet bottom. These ribs are then cap-stripped over

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the edge stock to simulate the small leading and trailing edges.

The struts were bamboo salvaged from a garden rake. The flying wires were music wire anchored in plywood with washers soldered to them. The stitching reinforcement was put on by inserting pins along the longeron positions and then lacing with thread. This was cemented in place with thin cement, then the pins withdrawn, a real neat job. He also had a Nieuport 17 constructed in the same manner. These models were very good flyers and Walt wasn't afraid to fly them.

The team race was very interesting, lacking only the San Diego boys who decided it is too much trouble to go up there once a month. The Williams brothers were doing their usual consistent flying, winning one 35-lap race with the Minnow which manages to go all the way on one tank full.

The WAM in their annual report have listed their champions for 1952 and a quite impressive array it is. John Lenderman of Stuka fame, who won stunt at the Nats, proved to be the true all-around model builder by winning the High Point Championship. He also was Stunt Champion with almost three times as many points as the runner-up. John, as we remember him, is quite active in F/F gas and an excellent Wakefield flyer. During all this time he was vice president of the WAM and quite active in that capacity.

Herm Shiman of the Aero Modelers of Alameda was Speed Champion. He also won D at the Nats. Vic Garner, whom we will always remember as the fellow who painted a model with lipstick in order to fly it in a contest, was Proto Speed Champion. Ted Goyet was top Combat man. Clifford Andrus won more 100 lap races while Kenneth was high man for the 150 lap races. Bob May, John Lenderman and Gordon Kibby tied in Balloon Bursting while Rudi Aron was top Scale winner. Bill Mackerracker proved to be the one with the most endurance. It all added up to Ted Goyet of the McClellan Pacemaker Modelaires being Champion of the special events.

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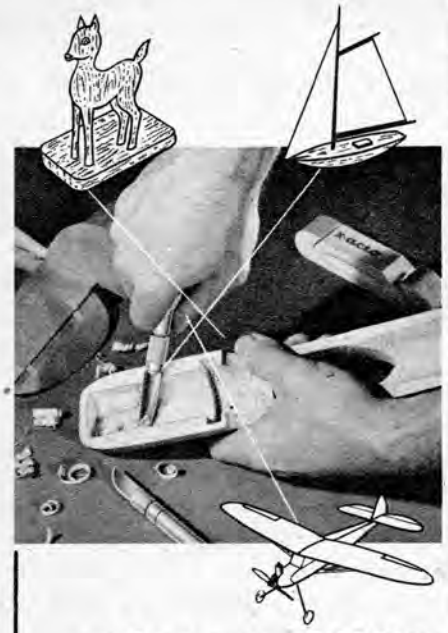

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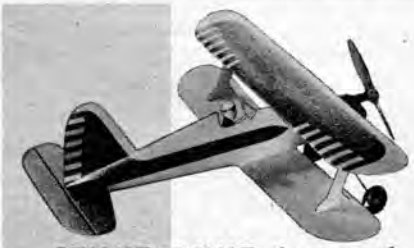

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sleep, with all their record keeping.

There are quite a few contests already scheduled for 1953; here's a partial list: April 19, NCFFC free flight contest at Mather Field. May 3, Oakland Cloud Dusters Half-A free flight team contest for teams of four and a *free lunch*. May 30-31, Twin Cities free flight contest at Marysville. June 21, September 20 and October 25: NCFFC free flight contest at Mather Field.

Going to the Nats? As mentioned last issue, we're trying to arrange carpool rides along the line of march from West to East. (This means Southwest too.) Write us!

—DICK EVERETT

CONTEST CALENDAR

List meets here! Advise Air Trails 90 days in advance to do the most good for your meet. If any area restrictions on entries, be sure to state. Address of contact man in same city as site of meet unless otherwise specified. Where info on events is furnished these are abbreviated as follows: indoor rubber powered—IR; outdoor rubber powered (unlimited)—ORU; outdoor hand launched gliders—OHLG; indoor gliders—IG; towline gliders—TL; free flight gas—FF; control line speed—SP; control line scale CLSC; control line stunt—ST; team racing—TR; combat—COM; radio control—RC; rise-off-water free flight—ROW; carrier models—CAR; free flight scale—FFSC; non-flying exhibition scale—NFSC; jet speed—J; controline endurance—CLEND; Wakefield—WAK.

April 19—Albuquerque, N.M. S.A.K.M.A.C. record trials. J. B. Cahill, 205 Bryn Mawr Dr., S.E.

May 3—Livermore, Calif Oakland Cloud Dusters Half-A F/F team contest. Hal Roth, 2224 Grant St., Berkeley 3, Calif.

May 30-31—Boston, Mass. Seventh Annual Plymouth meet.

May 30-31—Yuba City, Calif. 4th Exchange Club meet. Twin Cities MAC, Box 91.

May 30-31—Scottsbluff, Neb. Peanut Pilots meet. C. H. Adkins, 2017 Broadway.

May 30-31—Marysville, Calif. 4th Exchange Club meet. L. C. Armstrong, 229 R St., Yuba City.

June 7—Albuquerque, N. M. S.A.K.M.A.C. record trials. J. B. Cahill, 205 Bryn Mawr Dr., S. E.

June 21—Johnsville, Pa. Phila. Plymouth Dealers' meet.

June 27-28—Beaumont, Texas. Exchange Club meet (AAA). ORU; FF; SP; CLSC; ST; COM; J; RC. Don Still, 790 Liberty Ave.

June 28—Hicksville, L. I, N. Y. Aeronuts meet (AAA). S. S. November, 593 Lenox Rd., Brooklyn, N. Y.

July 27-Aug. 2—Lakehurst, N. J. & Willow Grove, Pa. 22nd National Championship Contest. A.M.A., 1025 Conn. Ave., N.W., Wash. 6, D.C.

Aug. 17—Albuquerque, N.M. S.A.K.M.A.C. record trials. J. B. Cahill, 205 Bryn Mawr Dr., S.E.

Aug. 30—Brooklyn, N. Y.—Mirror Model Flying Fair at Floyd Bennett N.A.S. Daily Mirror, East 45th St., N.Y.C.

Sept. 7—Far Hills, N. J. Bedminster-Far Hills Meet.

Sept. 20—Harrisburg, Pa. Penna. State Exchange Clubs' meet.

Sept. 21—Albuquerque, N.M. S.A.K.M.A.C. record trials. J. B. Cahill, 205 Bryn Mawr Dr., S.E.

(See also contest mentions in Dope Can, R/C and Western Roundup columns.)

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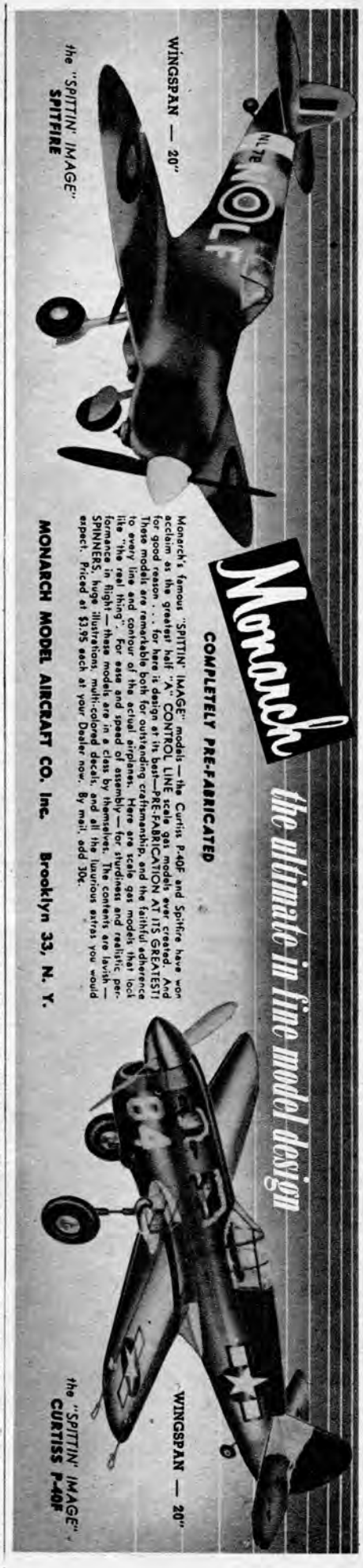
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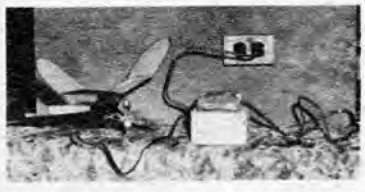
MIGHTY FINE FOR MAY!

Some of the outstanding features scheduled for the next issue of Air Trails: "The World's Fastest 'A'" by Sgt. George Mueller, USAF—complete lowdown on his 135 mph plus national and international record-holding speed model; "Sweet Sixteenth" by Aubrey "Red" Kochman, an easy-to-build Half-A free flight duration design; Douglas Rolfe's Air Progress sketches, "The Aeronca Story"; an exceptional Half-A radio model by the West Coast expert, Dick Schumacher—"Liberty Belle"; "Bartlett Bullet" is a fine .29 team racer by Warren Bartlett, director of the big Plymouth International Invitational Competition. Plus more, more, more.



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TELERADIO PRODUCTS

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Converting to 27¼

(*Continued from page 47*)

connection. The new setup uses a vertical rod antenna, and the insulators could have been repositioned on the front of the case to hold it. However, the transmitter is too light in weight to hold the required 9½ ft. antenna erect. The two insulators were just connected together inside the case, with one end of the coupling coil L2 connected to them and the other end run to the tab on the shaft of the variable condenser C1. The latter, incidentally, will vary in different transmitters, but you will need a condenser of at least 25 mmf. for the coil L2 we specify.

It was found necessary to push L1 right up against the end of L2, and note that it should be at the *plate* end. L1 should therefore be insulated; we used solid pushback hookup wire.

After checking your wiring very carefully, connect the batteries, using only 90 V. for the high voltage. It is much easier to get the outfit going without the antenna, but some sort of load *must* be used. About four turns of insulated wire soldered to a 2-volt pink bead pilot bulb will make an adequate load. Poke the bulb coil about halfway into L1 at the plate end.

You are now ready for the fireworks, so push the key and tune C1 to see if you get a dip on the plate meter. With good batteries, this meter will read around 20 ma. with the tube not oscillating, and will drop down sharply when C1 is tuned to resonance. At this point, your bulb load will light up. Check to make sure that C1 is not at full capacity (with the plates completely meshed) at resonance. If it is, add another turn to L2, or squeeze the turns closer together.

Now you can try 135 V. on the transmitter, but first, change the load bulb to a brown bead type (#40 or 47). This should light up fairly bright, and the plate current should be between 15 and 20 ma.

You will note that when approaching the point of resonance from the low-capacity side, the plate current will drop down smoothly till it reaches the lowest point. Then, as you rotate C1 further, the current will suddenly jump way up; this happens when the tube ceases to oscillate. We mentioned awhile back that crystals *can* be damaged in a circuit of this sort. Damage will be preceded by crystal heating, and when first tuning up the outfit, feel crystal holder occasionally. It may be just slightly warm, but if it gets hotter than this, it indicates that the circuit is not loaded sufficiently. Never operate this circuit with more than 135 V. on the plate.

Now you are ready to attach the antenna. It should be about 9½ ft. long, but any length between 9 and 10 feet will give good results. With the transmitter *on the ground*, push the key and tune the condenser for lowest plate current. It should hit this point at just about the same spot that it did with the bulb as a load, and plate current should be about the same. If it is too high—more than 20 ma.—push L1 away from L2 a bit. You will note that moving the key or pushbutton lead around will change the plate current a little. This changes the loading, and C1 should be set a little on the low capacity side of minimum plate current position. If this is not done, the tube may snap out of oscillation suddenly right at a critical moment in a flight.

The transmitter should always be set upon the ground. It is a good idea to put your batteries in a metal box, and attach the transmitter with its antenna to this

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MISCELLANEOUS

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box. That helps to keep the loading the same, no matter what sort of ground the transmitter is on.

After everything is tuned up properly, and a trial shows that it will stay that way, we strongly advise that the knob be removed from C1. You can put a slot in the shaft, if you wish, but you will seldom have to change it after the first tuneup, and lack of a knob will discourage the "knob-twiddlers."

Wen-Mac .049

(*Continued from page 50*)

prime (two or three drops) in the exhaust and one drop or nothing in the carburetor. Choking or a heavy prime in the carburetor caused the engine to kick and pop.

Several fuel mixtures were tested and best results were obtained with heavily nitrated mixtures blended for Half-A engines. During the engine test it was noted that the Wen-Mac ran with very little vibration at all speeds. This is an excellent feature for a lightweight engine.

Parts Illustrated

1. Fuel tank (regular): aluminum, ¾" dia. x 13/16" long, .11 oz. 2. Crankcase and needle valve body: die-cast aluminum, steel bushing, .32 oz. 3. Cylinder head: aluminum 23/32" dia., .10 oz. 4. Propeller: plastic, 5½/4, .16 oz. 5. Cylinder: steel, .421" bore x ¾" long, .21 oz. 6. Fuel tank (stunt): copper, ¾" dia. x 1⅛" long, .31 oz. 7. Spinner: plastic, 15/16" dia., .07 oz. 8. Crankcase cover: aluminum, 11/16" dia., .05 oz. 9. Needle valve: brass, 1-72 NF thread, .02 oz. 10. Crankcase cover gasket: fiber, .020" thick. 11. Needle valve spring: steel, .155" O.D. 12. Crankshaft: steel, hardened and ground, .218" dia. shaft, .090" dia. crankpin, .17 oz. Propeller drive washer: aluminum, ½" dia., .02 oz. Propeller nut: aluminum, 5-40 NC thread, .03 oz. 13. Glow plug: steel, 1.4-32 thread, .07 oz. 14. Glow plug gasket: aluminum, .032" thick. 15. Tank screw gasket: fiber: .016" thick. 16. Tank gasket: fiber, .015" thick. 17. Glow plug connector clip: brass. 18. Mounting bolts: steel, 3-48 N.C., .10 oz. 19. Fuel tank screws: steel, 3-48 N.C., .03 oz. 20. Fuel line: rubber, 3/64" I.D., .02 oz. 21. Piston: steel, hardened and ground, .421" dia. x ⅜" long. Connecting rod: aluminum, 23/32" long, .09 oz.

Engine Data

Performance. Weight: (less tank and propeller) 1.1 oz. Propellers: 6/3 wide blade wood, 9,500 rpm. 6/3 narrow blade wood, 11,500 rpm. 5.5/4 plastic: 13,800 rpm. 5/3 wood, 16,000 rpm. Fuel: hot mixtures for Half-A engines give best results. Fuel level test: 5" at 13,000 rpm.

Design Data. Displacement: .049 cu. in. Class: Half-A. Stroke: .357 in. Bore: .421 in. Stroke bore ratio: .85. Compression ratio head: 6.3. Compression ratio base: 1.43. Port area intake: .0146 sq. in. Bypass: .0105 sq. in. Exhaust: .0357 sq. in. Ignition: glow plug.

Construction Features. Bearings, crankshaft: steel bushing. Crankpin: aluminum. Wrist pin: aluminum. Beam and radial mounts.

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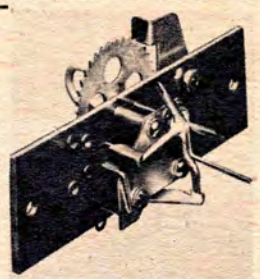

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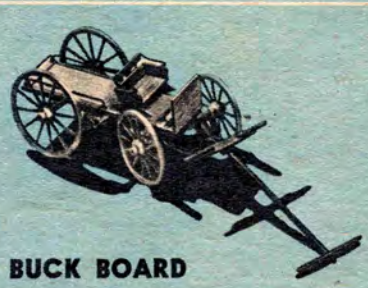
MEET WINNER

Berkeley has kitted Bob Elliott's meet-winning semi-scale stunt, originally an Air Trails model appearing in February issue as "The Black Tiger," as pre-fabbed "P-40 Warhawk" for engines from .19 to .35. Span is 45 in. Features stunt flaps, Flying Tiger decals, metal cowl. $4.95. Won two firsts at Orlando.

Frontier, the makers of those Early Western model kits in the red and yellow boxes, have a one-buck buck board job that's real nifty. Pine and balsa parts and molded plastic wheels. This is the vehicle that made history as it dashed across the plains into the Oklahoma Territory and towards all that oil, oil, oil!



BUCK BOARD

This is the Aristrol 27.255 mc. transmitter and E.D. "Boomerang" receiver (because it always comes back to you) which you've been hearing about in Howard McEntee's R/C Column. Transmitter is made by Aristo-Craft Miniatures and entire unit handled by Polk's Model Craft Hobbies of N. Y. C.

As fit companion to its S.E.5 kit and a natural combat opponent, Sterling presents its prefabbed Fokker D-VII of World War I fame as $5.95 job. She spans 32.5 in.; the Bipe is a big, impressive model with 27 in. fuselage. Takes engines in A, B and C. Optional wing flaps, formed landing gear, decals.

WWI FOKKER

DOODLE BUG

This is the Doodle Bug offered by Rainbow Models in kit form for $1.98. Length is 12 in. Takes Half-A engines and skims like mad over ice or water. Sounds like real fun. All parts are precut and shaped, making D.B. easy to assemble because of self-aligning slots. How about it, let's try something different.

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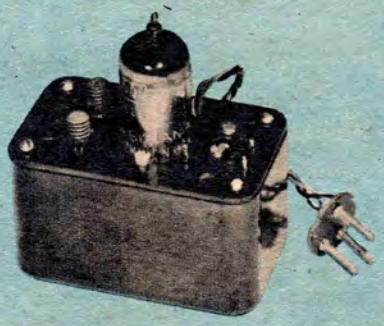
"TOW-LINER"

Jerry Brofman at Enterprise has sister ship to his well-known Towline Terror glider. This is the "Tow-Liner" with span of 2 feet and price of $1. Has high-lift Ritz-type wing and "Circlimatic" fuselage construction. The body goes together without much thought, should be easy for novice.



This is the Telecommander #951A receiver by American Telasco, Ltd. Size is 1.5 x 2.5 x 1.25 in. and with tube weighs 2.5 oz. High-tension voltage is 60-90 V. Low-tension voltage is 1.5 Volts. Price with tube, $18.95. Housing is lightweight, Bakelite case. Hard tube circuit; permeability tuning.

CLUB COUPE

Designed for powering with the Supermite electric motor, Ace's new club coupe kit #49R can be modeled with top up or down. Goes for $1.25 in kit form (without motor). Most parts are ready-shaped. Complete plans and instruction with each kit. Ace has extensive line of scale modern car vehicles.

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Dope Can

(Continued from page 57)

is Class A. Jim Clem and Sam Beasley, the old pros, took a lapped piston Class A McCoy out of the sack for a couple of contests and let loose with a 125 mph flight once and 130.42 mph flight the next contest. Everyone was in awe until the December contest when that fellow Bill Timmons let loose with another 6.9 sec., or in short another 130.42 to tie Clem's & Beasley's contest record. Gene Stiles is doing well with his Torp .19 job (International first-place winner). He pushed 125 mph consistently. For those who are wondering, all of these speeds are flown on the pylon.

"This Mr. Timmons is getting within striking distance of two national records. The thing that baffles everyone is that his McCoy .19 has a stock backplate, the old style front plate with only one ball bearing, and he runs a stock prop. His airplanes are extremely heavy for the classes as the Class A weighs over 13 ounces and the Class B over 18 ounces. Those engines are really pulling a load.

"Class B is completely dominated by Dooling .29's. The only McCoy .29 to show much promise the last year was Frank Stone's. He did 131 mph to take first in open at the Nationals. He was duplicating that speed when the rotary froze and the engine has never got back up there.

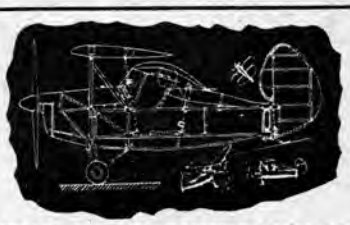
"The contest at Ft. Worth has a new speed event that has proven to be very interesting. This is Half-A speed. The line length is 35 feet of two .006 lines, or one .12 line. The engine classification goes up to .08 cu. in. The record now stands at 68 miles per hour with an .074 cu. in. This event has brought several new faces to the speed circle. It is an inexpensive way to really get a kick out of speed. More than once a youngster has placed in this event ahead of the regular old pros. The youngsters get a real kick out of beating the old hands and this event gives them a chance. The line length and engine sizes are questionable as we now are flying them, but the event can stand on its past merits.

"The old pen is about to run out of ink for this time and I'd hate to refill it as I need another speed tank for the coming contest so I'll close this letter to the modelers all over the nation. If any of you are passing through Fort Worth, Texas, around the first Sunday of the month, get out your gear and come out to Forest Park. The models will be in the air about 1 p.m.—till dark. We've been doing it for the last three years and expect to continue.

"As usual the beginning and ending of this type of epistle is strung out over several weeks. This one is no exception. Another contest has been held. Results were: Class B—130.32 mph by that fellow, Bill Timmons. Class D was a tie between Frank Stone and yours truly, at 142.82 mph. The real news was that Dock Baker got the Hornet .60 going and turned 138.5 mph."

Departure of a Grand Lady. Anyone who had business with the Washington headquarters of the A.M.A. during the past 15 years got to know Mae Simpson pretty well. Miss Simpson as assistant treasurer of the N.A.A. handled all the Academy funds and maintained "the books." And a better friend the model builder never had. As the years went by and the A.M.A. grew and grew, she gave more and more of her time to its work even though her NAA duties were considerable. She died at the age of 65. We know that all the past and present officials of the Academy feel the organization will never be quite the same again and certainly no one will replace her in their affections.

Another sad bit of news that came was the passing of Lawrence Miles of Medford, Oregon. Larry won 1st place in the junior Class B free flight event at the Los Alamitos Nationals with a time of 15:30.9. He was 11 when he died of polio. He'd been building models for two years and was a member of the Medford Prop Nuts. His winning plane at the Nats: O&R powered Cumulus using Top-Flite 10/6, Spitzy fuel; new fuselage and revamped lifting surfaces with 8 inches added to the wing at the center and 4 inches added to the stab at the center; silk covered, Testors dope.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Korea Contender Readies for Nats. Cpl. Bert Parker of Miami, Fla., a clerk in the 2nd Infantry Division's 702d Ordnance Company in Korea, spent all his combat zone spare time for three months building a 4.5 foot span "Gismo" free flight from scrap material. And then he thoroughly test flew it. Reason for his rushin'? He expects to be Stateside in time for the coming Nationals at Willow Grove, Pa. "Model airplanes have always been my hobby," the corporal said, "and I think the one I've built over here is every bit as good as the plane that brought me two seconds and a third in the 1950 Nationals." Covering on Gismo is silk, by the way; the Army Home Town News Center says "most of the plane was constructed from scrap material found around the company area." Sounds a lot different from certain other company areas!

Via Irv Polk of the mighty Polk enterprises we hear of Pfc. H. Jimmy Freedman of the 330th Comm. Recon. Company—hez building a complete HO model railroad, car by car and piece by piece when off duty.

Revised Team Race Rules. The F.A.S.T. Club which holds races at the Santa Anita, Calif., race track and is responsible for the creation of team racing, has come up with some important rules changes. These are designed to simplify the event, speed up procedures and make everything more interesting for both the contestant and the spectator. The changes are:

1. Cross section at the cockpit—minimum depth from the top of the pilot's head to the bottom of the fuselage must be at least 3¾ inches. Minimum width of the fuselage at the pilot's shoulders *and also at his hips* must be at least 2 inches. His hips will be considered to be 2 inches below his shoulders.

2. Tail skid loop must have an inside diameter of at least ¼ inch.

3. Any engine with a displacement from .18 to .40 cubic inch may be used.

4. If an engine speed control device is used instead of a cut-off, it must be capable of bringing the model to a complete unassisted stop.

5. Each model will have only one chance to fly in each race.

6. Grouping of models for the 21 lap heat races will be by drawing of numbers.

7. Races and points:

	1st	2nd	3rd	4th
21 lap heat races	19	14	9	4
35 lap heat races	28	22	16	10
70 lap heat races	39	32	25	18
100 lap consolation race	40	35	30	25
140 lap feature race	50	45	40	35

8. Beauty points: design and realism, minimum 1 point, maximum 5 points; workmanship and finish, minimum 1 point, maximum 5 points.

9. Each model will be judged for Beauty and these points will be added to the heat race points to determine which models fly in the final races.

10. The Trophy Dash of 14 laps will be flown by the three models having the highest number of Beauty points. The Beauty trophy will go to the model with the most Beauty pts. which completes Trophy Dash.

Clubs Check In. We're in receipt of the names of many new clubs and new addresses for old groups. Soon "AT" will be running another Club Directory. Tell your club secretary to write for an official registration form—no charge for the form or the listing.

Danville, Va.—George Washington High School Glue Daubers; meets every Thursday after school; contests, movies, question and answer sessions; Miss Reynolds, sponsor; Neal Howard, president; 10 members.

Phoenix, Ariz.—Brophy College Prep Balsa Butchers; meets every Wednesday at 1 p.m.; contests; 18 of the 38 in the Freshman class are members; George Meno, president.

Miami, Fla.—Miami Modeleers; 15 active members in U/C, F/F and R/C; meetings every week; Dub Davis, president; contact Bill's Hobby Shop, 9028 N.W. 22nd Ave., Miami, Fla.

Lancaster, Minn.—Lancaster High School M.C.; Fred Suppes, president; Robert A. Hed, faculty adviser.

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Kit includes all necessary parts (except tube and batteries): Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensers, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.

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Super-regenerator circuit, 100% dependable.

• NEW "locked-channel" dust-core tuning.

• Light in Weight, 2¾ oz. less batteries.

ASSEMBLED UNIT With tube — less batteries $21.95

IN KIT FORM: less tube $13.95

Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensers and eyelets attached; all electrical components, condensers, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.

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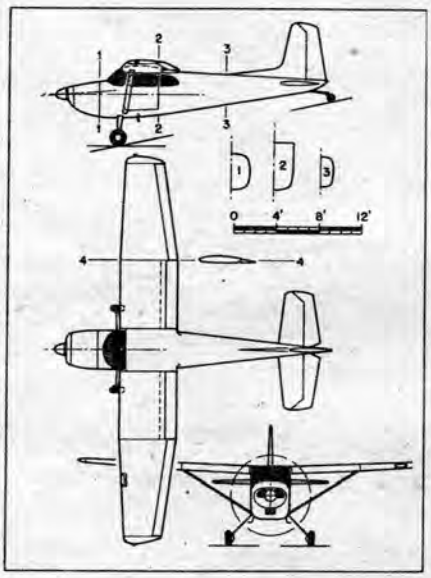
Mirror Meet. The eighth annual Mirror Model Flying Fair will be held on Sunday, August 30 at the U. S. Naval Air Station, Floyd Bennett Field, Brooklyn, N. Y.

This change from the location of the meet in past years at Grumman Aircraft Engineering Corp field in Bethpage has been made due to Grumman's stepped-up production and testing schedules which do not permit the use of their field and runways this year.

According to present plans all events which have featured previous Mirror meets will be continued this year at Floyd Bennett and in addition it is planned to add a Hand-launched Glider event for beginners of 8 to 11 years of age whose participation will be confined to this one event.

With the ample facilities available at the Naval Station it is not anticipated that there will be any reduction in the number of contestants and that 1,000 flying numbers will be assigned as in the past.



NEW CESSNA 180

Care to Write? Larry Durham, 123 W. Mosher St., Baltimore 17, Md., wants plans for twin engine scale models. Will swap single engine plans for same.

Sgt. Thomas W. Atkinson, 114th Bomb. Sq. (M), March Air Force Base, Riverside, Calif., is looking for some Navy data—Class B U-control plans for the Grumman TBF Avenger, to be exact. Can anyone help? Also wants to correspond with British model builders.

A real live wire in promoting model building is Sidney Miller, model airplane club instructor at the Williamsburg Youth Center's Humboldt Branch (Humboldt and Scholes Street) in Brooklyn, N. Y. For more than 2½ years Sid has been running a club which takes in about 50 members from 7 to 18 years of age. Willis Brown of the Office of Education in Washington turned in a glowing account of the work of the center, its model club and the folks who run it. We figured that other youth centers in the metropolitan New York City area interested in starting an aeromodeling program might like to check in with the Brooklyn organization for suggestions. The phone number there is EVergreen 7-0912.

DeVaughon Bowen, 1427 East Emma, Tampa, Fla., builds scale models, shelf-type. Looking for a pen pal.

Brian A. Newman, P.O. Box 1933, Capetown, South Africa, is a keen speed flyer in the A and B classes, would like to correspond with like-minded modelers in the U. S. He's a member of the South African Model Aeroplane Club's Capetown branch. Hopes to do big things in the next Nationals scheduled for Johannesburg.

—THE DOPESTER

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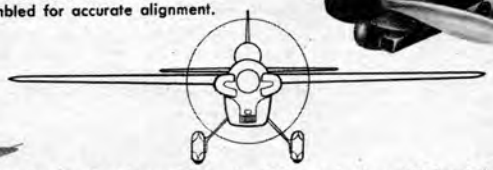

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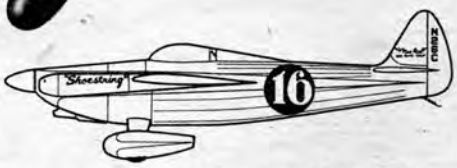

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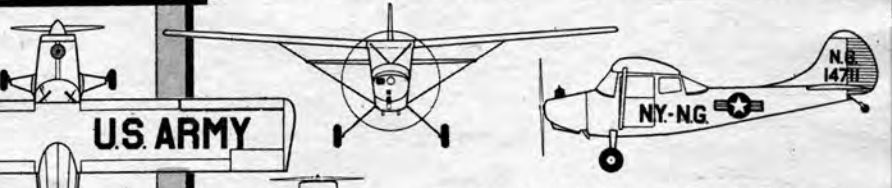

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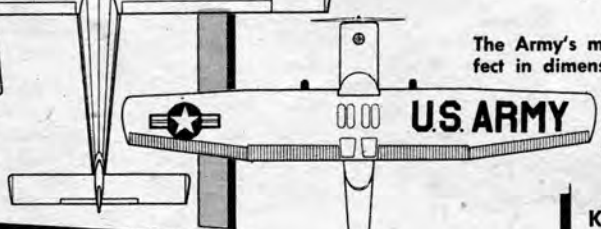

Accurate and up-to-date National Guard Fuel-Proof Decals included in kit. Plans also show Pre-Korean Army markings.

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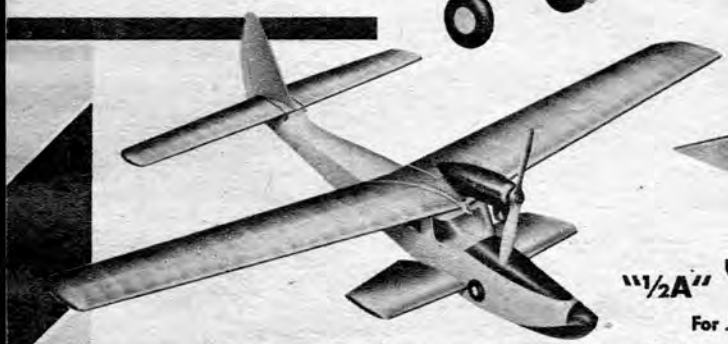

Hydro flying hints are described in detail on the plans.

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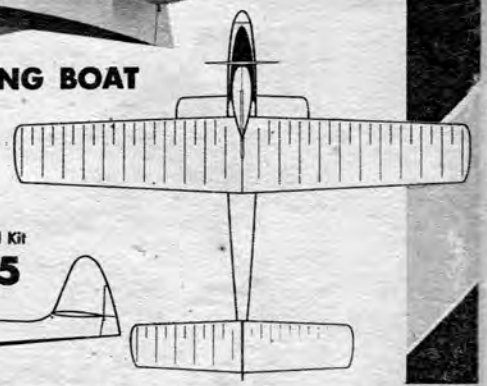

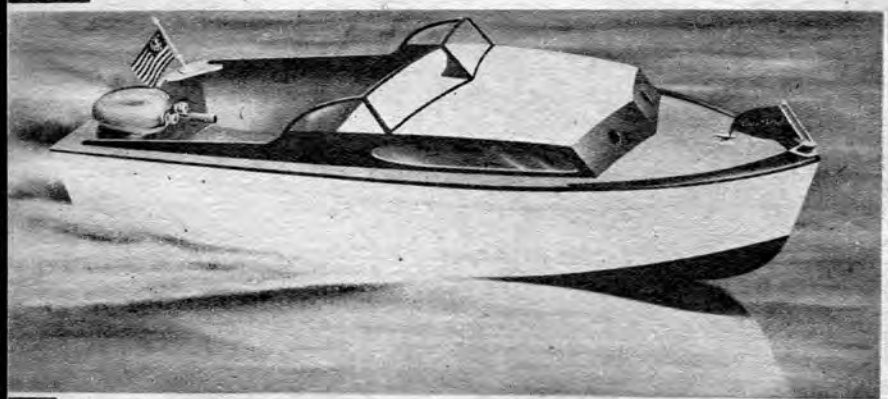

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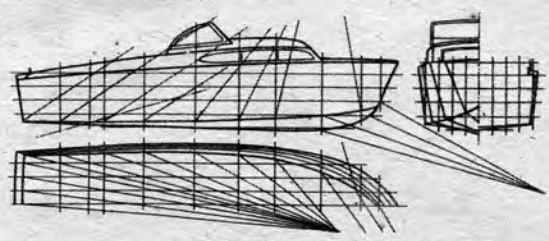

Designed by the Intersecting Conical Lofting Method. Mahogany Veneer construction is used throughout. All wood parts are accurately Die-Cut to shape, and need only be assembled.

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